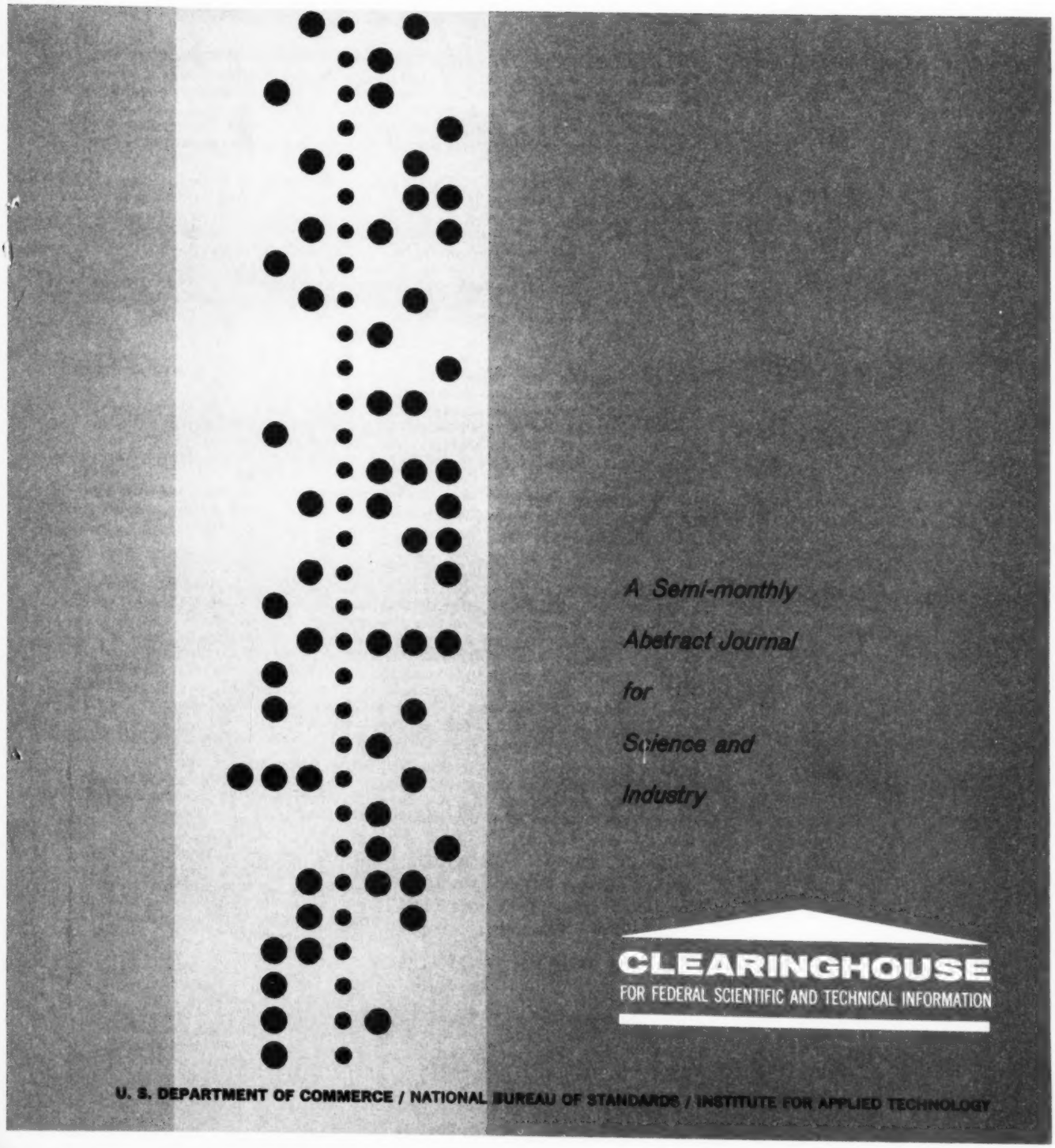
November 5, 1965

U.S. GOVERNMENT

RESEARCH & DEVELOPMENT REPORTS



A Semi-monthly Abstract Journal for Science and Industry

CLEARINGHOUSE
FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION

U. S. DEPARTMENT OF COMMERCE / NATIONAL BUREAU OF STANDARDS / INSTITUTE FOR APPLIED TECHNOLOGY

November 5, 1965 / Volume 40, Number 21

U.S. Government

RESEARCH AND DEVELOPMENT REPORTS

Issued twice a month by the Clearinghouse for Federal Scientific and Technical Information. Annual subscription $15 ($3.75 additional for foreign mailing). Single copy $1. Make remittance payable to Superintendent of Documents and mail either to a U.S. Department of Commerce Field Office or to Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. Address changes should be sent to Superintendent of Documents.

PURPOSE

U.S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS is published by the Clearinghouse for Federal Scientific and Technical Information to announce the availability of new reports of U.S. Government-sponsored R&D released by the Department of Defense and other Federal agencies. Included are reports from the Atomic Energy Commission and the National Aeronautics and Space Administration, which issue separate announcement journals as noted below.

FORMAT

USGRDR contains two sections with a combined table of contents. The first section, "Technical Abstract Bulletin" (TAB), announces reports released by the Defense Documentation Center (DDC) of the Department of Defense. The second section, "Other Research Reports and Related Material," announces reports released by civilian agencies and also includes certain older military reports. Reports are listed by accession/report number under 22 major subject category headings. Both sections contain abstracts and complete bibliographic citations and are followed by their respective indexes. Reports of current high industrial interest are featured in "Research Highlights."

HOW TO USE

Readers are urged to review all abstracts in their fields of interest, noting accession/report numbers and titles of reports to be ordered. Although primarily for retrieval, the descriptors provide a quick grasp of a report's scope. The reader is reminded that reports applicable to his field may be found under various subject category headings; the various indexes will aid in locating those reports. A single reference guide to new Government-sponsored technical literature, *Government-Wide Index to Federal Research and Development Reports*, is compiled monthly by the Clearinghouse from the combined indexes of this journal, *Nuclear Science Abstracts* (AEC), *Scientific and Technical Aerospace Reports* (NASA), and *Technical Abstract Bulletin* (DDC). This combined index is available from Superintendent of Documents, U.S. Government Printing Office, annual subscription $16, ($4.00 for foreign mailing) or $1.75 single copy.

TO ORDER REPORTS

All reports announced herein are available to the general public from the Clearinghouse, or in some cases from other sources as noted. To order Clearinghouse reports, use accession/report number (as given on the first line of each entry) and title from the Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, or from any Commerce Field Office (listed on inside back cover). Prices for hard copy (HC) and microfiche copy (MF) are given for each entry. Prepayment is required unless purchases are to be charged to Clearinghouse deposit accounts. Order forms will be found in the back. Make check or money order payable to National Bureau of Standards—CFSTI.

OTHER JOURNALS

Reports of the National Aeronautics and Space Administration and the Atomic Energy Commission can be ordered from the Clearinghouse. They are abstracted in the following journals available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

NUCLEAR SCIENCE ABSTRACTS, Atomic Energy Commission, $30 a year domestic, $37 foreign, $1.75 single copy plus 25 percent foreign mailing.

SCIENTIFIC AND TECHNICAL AEROSPACE REPORTS. National Aeronautics and Space Administration, $33.00 a year domestic, $42.00 foreign, $2.50 single copy plus 25 cents foreign mailing.

U.S. DEPARTMENT OF COMMERCE
John T. Connor, Secretary

CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION
Springfield, Va. 22151
Bernard M. Fry, Director

Contents may be printed freely. Mention of source will be appreciated.
Use of funds for this publication approved by the Director of the Bureau of Budget, June 30, 1961.

special ANNOUNCEMENTS

CLEARINGHOUSE ANNOUNCES RESEARCH ASSOCIATE PROGRAM

A Research Associate Program to study methods for the effective dissemination of technical information has been announced by the U.S. Department of Commerce's Clearinghouse for Federal Scientific and Technical Information. Beginning October 15, 1965, senior level scientists, engineers, documentalists, and librarians will have an opportunity at the Clearinghouse to do research aimed at improving the handling of scientific and technical information, according to Bernard M. Fry, Clearinghouse Director.

Research Associates will be self-supporting, individually or through sponsoring organizations such as private industry, professional societies, or Government agencies. The program is also open to candidates for the doctoral degree in information science who wish to perform research in partial fulfillment of their academic degrees.

The Clearinghouse provides a unique setting for such a program because of its focal position as the national center for the dissemination of Government-generated information on science and technology. The Clearinghouse program will operate within the framework of an existing National Bureau of Standards Research Associate Program. Inquiries should be directed to Bernard M. Fry, Director, Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Va. 22151.

PRICE INCREASED ON PATENT COPIES

Copies of patents, announced in USGRDR and available from the Commissioner of Patents, Washington, D. C. 20321, have been increased in price from 25 cents to 50 cents as of October 25, 1965.

USGRDR GOES TO AUTOMATIC PHOTOCOMPOSITION

Another phase of our continuing program to improve the appearance and utility of the USGRDR is now underway. The white section (Technical Abstract Bulletin) is now prepared on computer-actuated photocomposition equipment. The blue section (Other Research Reports and Related Materials) will be included shortly in this new system of photocomposition to produce a journal of uniform printing format.

Automatic photocomposition of the USGRDR starts with the document records (indexing data and abstracts) prepared on punched paper tape at the Clearinghouse. This tape is then put through a series of computer conversion processes for insertion into automatic photocomposition equipment at the U. S. Government Printing Office. From the final computer input the photocomposition equipment produces page length columns with justified margins. These columns are then assembled into complete journal pages for photo-offset printing.

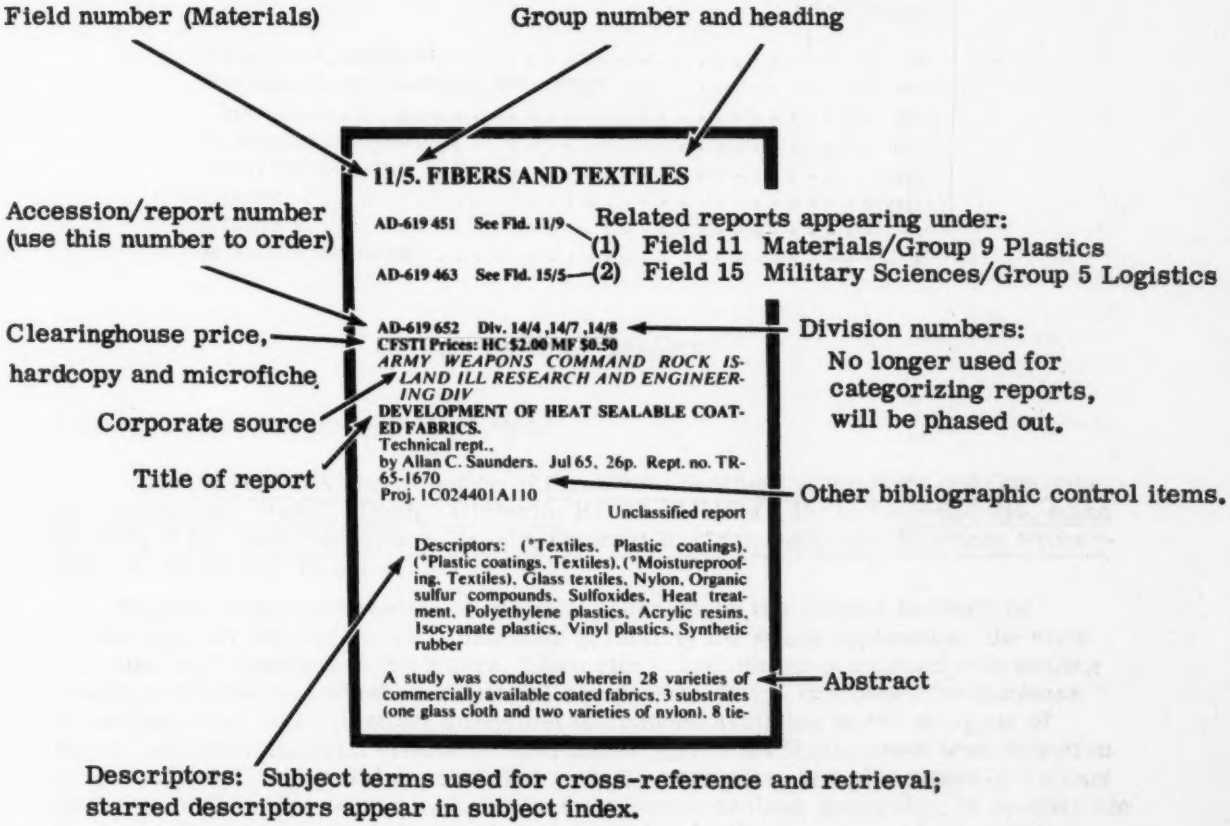
One of the features of the new format is the use of contrasting type faces, enabling the eye to separate quickly the different parts of the report citation.

Of even greater value to the reader is the ability of the computer-directed system to cross-reference reports applicable to more than one Field and Group. Thus, for example, the reader interested primarily in Fibers and Textiles—Group 5 under Field 10 Materials—is referred to related reports announced and abstracted under other Fields and Groups. A diagrammed sample appears on the facing page.

As in all projects involving new equipment and procedures it is inevitable that some errors will occur. These will be eliminated in future issues.

The indexes to both sections of the journal will continue to be processed in the conventional manner without automatic photocomposition.

A DIAGRAMMED ENTRY


Field number (Materials)
Group number and heading
11/5. FIBERS AND TEXTILES
Accession/report number (use this number to order)
AD-619 451 See Fld. 11/9
AD-619 463 See Fld. 15/5
Related reports appearing under:
(1) Field 11 Materials/Group 9 Plastics
(2) Field 15 Military Sciences/Group 5 Logistics
AD-619 652 Div. 14/4 ,14/7 ,14/8
Clearinghouse price, hardcopy and microfiche
CFSTI Prices: HC $2.00 MF $0.50
Division numbers:
No longer used for categorizing reports, will be phased out.
Corporate source
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
Title of report
DEVELOPMENT OF HEAT SEALABLE COATED FABRICS.
Technical rept.,
by Allan C. Saunders. Jul 65, 26p. Rept. no. TR-65-1670
Proj. 1C024401A110
Other bibliographic control items.
Unclassified report
Descriptors: (*Textiles, Plastic coatings), (*Plastic coatings, Textiles), (*Moistureproofing, Textiles), Glass textiles, Nylon, Organic sulfur compounds, Sulfoxides, Heat treatment, Polyethylene plastics, Acrylic resins, Isocyanate plastics, Vinyl plastics, Synthetic rubber
A study was conducted wherein 28 varieties of commercially available coated fabrics, 3 substrates (one glass cloth and two varieties of nylon), 8 tie-
Abstract
Descriptors: Subject terms used for cross-reference and retrieval; starred descriptors appear in subject index.

RESEARCH highlights

Reports of current high industrial interest

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Adhesives, Sealers

TWO-VOLUME REVIEW OF SEALANTS

(Order AD-620 044 Investigation of Structural Sealing Parameters and Concepts for Spacecraft. Part I. Design Criteria, HC $6.00/MF $1.25; and AD-620 045, same title, Part II. Leak Detection--Repair, General Environment, and Materials Properties, HC $3.00/MF 75 cents.)

Although a two-part review of sealants prepared by the Illinois Institute of Technology for the Air Force is intended primarily for space application, the work will also be of interest to designers, fabricators, and others concerned with sealing vessels, chambers, and other industrial equipment. Part I discusses mechanisms of sealing, seal classification, analytical techniques available to the designer of seals, and environmental effects on seal materials. Part II discusses leak detection and repair, environmental aspects that must be overcome, and properties of various seal materials. The work concludes that elastomer sealing, generally, is an optimum method. The elastomer deforms almost entirely elastically, and conformability is achieved at relatively low contact stress values. The initial mating flange surface finish does not affect the leakage level attained. Plastic seals or gaskets may be used where low contact stress is necessary and some leakage can be tolerated. The increase in contact stress necessary to achieve about the same leakage values as with rubber seals is one order of magnitude. Plastics, however, have limited application when used alone as seal materials due to their cold flow and permeability characteristics. Plastics bonded to metals or other materials in thin layers are generally more appropriate as seal arrangements. Metallic seals, because of the high loads necessary to achieve conformability, should be used only where the environment demands them. When metallic seals are used, structural seal geometries which promote plastic deformation between the mating surfaces are recommended for static applications.

Biological and Medical Sciences

NASA OUTLINES MEDICAL USES FOR SPACE BIOTELEMETRY

(Order NASA-SP-5023 Medical and Biological Applications of Space Telemetry, HC 45 cents.)

Biotelemetry, the electronic monitoring systems used to measure from afar such things as astronaut blood pressure and respiration, is one of the many areas in which the National Aeronautics and Space Administration has achieved major technological advances of great potential for non-space medical use. A report prepared by NASA's Technology Utilization Division outlines biotelemetry applications for intensive care wards, surgery and anesthesiology, diagnostic monitoring in office procedures, psychophysiology, and everday medical practice. Biotelemetry may be employed when the measurements must be made in a confined location where there is space only for the measuring unit and a small amount of data transmission equipment. Typical applications in which the point of measurement is physically inaccessible are the measurement of pH (acidity level) in the stomach, and the measurement of temperature, respiration, and cardiac rate of a subject in an iron lung or oxygen tent. A fetus is inaccessible in this same sense. The need to isolate patients with contagious diseases and to minimize their contact with hospital attendants results in a kind of inaccessibility. A patient undergoing surgery is inaccessible to the extent that parts of his anatomy are draped, and these coverings cannot be removed to monitor physiological parameters. Patients in transit from one part of the hospital to another (such as from surgery to recovery) are also inaccessible to conventional means of measuring physiological parameters. Patients living at home are obviously inaccessible to the hospital staff. NASA points out that in all such instances and in literally hundreds of others, biotelemetry as developed in space programs can be adapted to help the surgeon, the physician, and the nurse.

Chemicals

JANAF THERMOCHEMICAL TABLES AVAILABLE TO ALL LABORATORIES

(Order PB-168 370 JANAF Thermochemical Tables, HC $10.00/MF $3.50.)

The long-awaited JANAF Thermochemical Tables, now published in a single document, give data as a function of temperature for elements and compounds — both common and exotic, liquid, solid, and gaseous. With the publication of the Tables, all laboratories as well as the entire aerospace industry now have one single source of carefully evaluated data on the thermodynamic properties of compounds which are used in many areas of technology as well as in propellants.

The book contains 811 tables of thermodynamic properties in the solid, liquid, and/or ideal gaseous state of 24 elements (Al, B, Be, Br, C, Cl, F, Fe, H, Hg, I, K, Li, Mg, N, Na, O, P, Pb, S, Si, Ti, W, and Zr) and their simple compounds tabulated at even 100° intervals to 6000°K. The Tables give such data as heat of formation, heat capacity and entropy, heat of sublimation or heat of vaporization, melting points, plus electronic levels and vibrational energy levels. They cover such uncommon

compounds as titanium oxide fluoride and phosphoryl difluoride chloride. For instance, for boron there are 98 tables, 94 of which are for compounds ranging from boron monobromide (BBr) to dilead decaborate ($B_{10}O_{17}Pb_2$).

The JANAF (Joint Army-Navy-Air Force, ARPA and NASA) Tables were compiled over a 6-year period in a project sponsored by the Advanced Research Projects Agency. Dow Chemical compiled them and a JANAF Thermochemical Panel of scientists from Government and industry collaborated to critically review them prior to their publication and distribution. According to the Panel: "This approach was designed to insure that the Tables be of the highest possible quality."

The new Tables fill serious gaps in the data heretofore available. In the mid-1950's, when elements other than the conventional carbon, hydrogen, oxygen, nitrogen, chlorine, and fluorine came into consideration as rocket propellant ingredients, physical chemists faced formidable problems when they had to conduct rigorous theoretical performance calculations for these new propellants. The first major problem was calculational techniques; the second was the lack of accurate thermodynamic data.

Computers substantially resolved the calculational technique problem. By the end of 1959, when the large high-speed computers became available to rapidly perform the almost overwhelming number of calculations required for the application of the method of minimization of free energy, the calculations became as accurate as the thermodynamic data upon which they were based.

"However, serious gaps were present in the available data," says ARPA. "For propellant ingredients, only the standard heat-of-formation is required to conduct a performance calculation. However, this must be known to a high degree of accuracy. For combustion products, the enthalpy and entropy must be known, as a function of temperature, in addition to the standard heat-of-formation."

To resolve the problem of a lack of accurate thermodynamic data, a substantial experimental thermodynamic research program was therefore launched under ARPA's sponsorship and technical direction, the new Tables being the end result of the massive effort.

But the production of the Tables will not bring the 6-year project to an end. The Tables will be updated and revised periodically, with Tables for additional elements and compounds being brought to the attention of science and industry as the Clearinghouse receives them from the originating group.

Communications

A SENSITIVE DETECTOR OF JIGGLING LIGHT

(Order AD-619 400 Demodulation of Frequency or Space Modulated Light, HC $6.00/MF $1.25.)

A transverse-wave FM phototube designed by Stanford Electronics Laboratories has proved to be a very sensitive detector of jiggling light. According to Stanford engineers, the FM phototube may possess a significant advantage over other detectors, and a Federal evaluator says the demodulating technique developed may very well

prove to be an important advance in optical communication systems. The Army-sponsored work began as a study concerning the generation and detection of a light beam which is deflected back and forth at a microwave rate in accordance with frequency modulation on the beam. Deflection was achieved by sending the FM light through a dispersing element. Stanford built a detection system that consisted of a photocathode which emitted a transversely modulated electron beam into a transverse-field interaction circuit.

That the FM phototube is an extremely sensitive detector of microwave-rate jiggled light beams is evidenced by a signal output three orders of magnitude above the limit of 5 microns. This capability, says Stanford, could conceivably be an end in itself, such as in acoustic diffraction or vibrating surface experiments. The Stanford study notes, in conclusion, that a very sensitive wideband FM detection scheme might be constructed using a dispersing element, an optical attenuator with a linearly-varying attenuation in the direction of spot movement, and a wideband microwave photomultiplier with the noise suppression advantages of space conversion with a large spot movement (modulation index).

Food Processing

CLOSTRIDIUM BOTULINUM SPORES TESTED FOR THERMAL RESISTANCE

(Order COO-1095-3 A Study of the Effect of Ionizing Radiation on Resistance, Germination, and Toxin Synthesis of Clostridium Botulinum Spores, Types A, B, and E, HC $4.00/MF 75 cents.)

Thermal resistance of spores of 11 strains of Type E Cl. botulinum have been studied at the University of Michigan in phosphate buffer at pH 7.0 in the temperature range of 60-90°C. According to the AEC-sponsored biologists, all strains had a similar resistance to heat. Very little inactivation occurred at 60°C and 65°C, but at 70°C-90°C there is a rapid initial kill of the majority of the spores in the population within 10 minutes of heating with a small fraction surviving longer heating times giving a tailing effect. With two strains slight activation of dormant spores was apparent at 70°C. Toxin production was detected by the spores surviving heating at higher temperatures and for longer periods of time. However, in some cases nontoxic isolates were obtained. Spores produced by the heat-surviving spores had a resistance similar to the stock spore suspensions. Resistance of the spores of six strains of Type E to gamma radiation in phosphate buffer was found to be similar, but less than Type A spores. Irradiation of the spores in haddock homegenates and oyster juice resulted in an increase in survivors which was 100-1000 fold greater than that resulting from irradiation in phosphate buffer. This study was prompted by the September 1963 outbreak of Type E in Michigan. (Announced in this issue on page S-9.)

Optics

MEASURING PULSE LASER OUTPUT

(Order AD-618 031 Pulse Laser Instrumentation, HC $3.00/MF 75 cents.)

High accuracy, stability, and relative simplicity are characteristics of the techniques and devices used to measure pulse laser output at the Air Force Weapons Laboratory. In addition, the devices lend themselves to the measurement of a wide range of energy densities. A document issued by the laboratory describes principles, physical design, associated circuitry, and impedance-matching techniques. The instrumentation system consists of a total beam calorimeter suited to the laser energy range and an integrator whose signal is correlated to calorimeter measurement. The calorimeter is either an absorbing surface or volume arranged so that the energy is well trapped. The surface absorber is a thermally isolated hollow silver sphere whose inner surface has been highly polished and whose heat capacity can be accurately calculated.

Plastics

ETHYLENE TO POLYETHYLENE VIA GAMMA RADIATION CUTS PROCESSING COSTS

(Order BNL-8993 Preliminary Cost Estimate for a Co^{60} Gamma Radiation Induced Ethylene Polymerization Process, HC $2.00/MF 50 cents.)

A cobalt-60 radiation polymerization process makes possible significant reductions in investment and production costs for the conversion of ethylene to conventional low density polyethylene, according to AEC's Brookhaven National Laboratory. Other grades of polyethylene can be made by the same process at comparable costs, and the value of the Co^{60} is not a large factor in the conversion process. Cost estimates show the radiation source is less than 16 percent of the total plant investment.

With Co^{60} radiation, Brookhaven says it's possible to conceive of a single versatile plant producing a variety of polyethylene grades from low to high density. This is accomplished by changing intensity, dose, pressure, and temperature. This versatility can be extended to copolymer systems without changing catalyst systems since the initiation mechanism is independent of pressure, temperature, and the state of the monomers. Also of significance is the demonstration that carbon monoxide can be copolymerized with ethylene in a radiation field thus reducing the raw material cost by as much as 2 cents per pound of polymer.

As to plant safety, the radiation process may be inherently safer than a conventional process: No internal chemical initiator such as oxygen or peroxide is used. The chemical initiator requires an activation energy while radiation initiation requires none; with less energy needed to initiate, there is less potential for an explosive decomposition to occur in the radiation process. The Brookhaven report closes with tables of capital investment and production cost figures.

R & D REVIEWS

Available FREE from the Clearinghouse

FIBER-REINFORCED METALS AND ALLOYS (OTR-127)

Important advances have been made in two areas in Government-sponsored research and development in fiber-reinforced metals and alloys--in the development of whiskers of high strength metals or ceramics for use as reinforcement agents, and in the development of metal matrices for metals, ceramics, or glass. Promising candidate materials for fibers are graphite, boron, alumina (sapphire) silicon carbide, boron carbide, beryllium, and beryllia. Titanium, beryllium, chromium, zirconium, iron, nickel, and cobalt are considered promising matrix materials. Whiskers are grown chiefly by the vapor deposition technique, involving controlled supersaturation of a vapor over the surface of a substrate. The couple-stress theory has been developed to qualify microbodies and microlayers mathematically. Fiber-matrix composites developed and tested include steel-silver, tungsten-silver, and alumina-nickel. Reports describing these and other developments are available from the Clearinghouse and are reviewed in OTR-127, prepared for the NBS Institute for Applied Technology. One report on fiber technology, for example, determined a common imperfection in whiskers--the axial screw dislocation formed as a consequence of the spiral growth process--and indicates how the removal of these dislocations results in optimizing the great strength of the whiskers. Another report on composite metals evaluates the industrial development of structural materials where either the matrix or the fibers are metallic. (Announced in this issue on page S-26.)

PLASTIC COATINGS (OTR-128)

Significant reports on plastic coatings offering a wide range of uses for industry are available from the Clearinghouse, a review prepared for the NBS Institute for Applied Technology discloses. Reports tell how, for example, compounds tested under the deteriorating effects of long-term storage at high humidity and temperatures have proved that laminates can be developed to withstand conditions previously found destructive to single transparent film barriers. Reports also indicate that plastic coatings intended for space environments and underwater applications can serve to correct past failures of coatings, especially those used for steel fuel storage tanks. Use of the fluidized bed technique for coatings, both plastic and metallic, has revealed among its beneficial uses great future applications for sealing out liquid penetration in electrical, electronic, and mechanical equipment. Plastic coatings developed in Government research and development also show promise where special heat-resistant, rain-erosion-resistant transparent barriers are needed. Significant reports presenting the possibilities for the use of metallized Teflon capacitors in extreme-service circuitry predict their soundness technically and economically, as well as indicate their commercial applications. Other long-term studies described evaluate the commercially available epoxy and polyurethane resin conformal coatings as protective surfaces on glass-epoxy and paper-epoxy printed circuit boards. Reports describing other recent significant plastic coatings research are also available, grouped and discussed in the review under these headings: Applying plastic coatings by the fluidized bed technique, TFE coatings and their varied uses, metallized Teflon

capacitors and conformal coatings, heat-resistant and rain-erosion-resistant coatings, and plastic coatings for packaging. All the reports are available from the Clearinghouse. (Announced in this issue on page S-26.)

BRAZING TECHNOLOGY AND APPLICATION (OTR-129)

The need for materials and structures to withstand the high operating temperatures encountered today in industry, and particularly the requirements imposed by space and nuclear developments, has increased Government efforts to improve brazing techniques, especially for refractory metals. More knowledge has been gained about traditional techniques for brazing such as torch, twin carbon arc, furnace induction, and resistance which are now employed extensively in Government projects. Furnace brazing, for example, is being used in the fabrication of many complex items such as rocket nozzles and heat exchangers. Recently developed techniques in Government work include exothermic chemical reaction, electron beam, and diffusion sink brazing. In extending brazing technology, Government research has proceeded along at least two lines: The application of improved types of filler metals and new brazing techniques for joining many types of metals, and the improvement of brazing techniques required for the fabrication of such complicated structures as heat exchangers and honeycomb sandwich panels. OTR-129, a review prepared under sponsorship of the NBS Institute for Applied Technology, describes many reports on these developments, which are available from the Clearinghouse. One report on brazing of high temperature materials evaluates eleven different filler metals for use in the electron beam brazing of beryllium joints. Another report on joining techniques describes three exothermic brazing techniques which use the heat liberated by an exothermic chemical reaction to melt the filler and heat the base metal. A third report on structure fabrication describes a procedure for welding and back brazing 326 closely spaced tubes in a bundle to serve as a heat exchanger. A fourth report on honeycomb sandwich panels describes manufacturing methods and design procedures for brazing refractory metal sandwich panels.

HIGH-TEMPERATURE, FIRE-RESISTANT HYDRAULIC FLUIDS (OTR-130)

Recent Government-sponsored research has led to the development of a number of fire-resistant hydraulic fluids capable of withstanding extremely high temperatures without bursting into flame. Conventional hydraulic fluids based on flammable petroleum and its products present an undue fire hazard in some modern equipment. Researchers seek fluids with high flash, fire, and autoignition temperatures; high hydrolytic stability; low pour point and vapor pressure; low viscosity; good lubricity; high bulk modulus; low foaming tendency; noncorrosivity to metals; chemical compatibility with various rubbers, plastics, and paints; nontoxicity; and oxidation resistance. In practice it has been very difficult to devise a material that will meet all these requirements for a particular use; however, promising candidates are undergoing development. OTR-130, a review prepared under auspices of the NBS Institute for Applied Technology, describes Government work in materials research, water-base hydraulic fluids, and organic-base hydraulic fluids. Reports emanating from these projects are also indicated in the review and are available from the Clearinghouse. A report on water-base hydraulic fluids, for example, describes five promising classes of compounds under development as additives to impart desirable properties to the fluids. A report on organic-base fluids describes the development of trimeric and tetrameric phosphonitrilates with excellent wear and other properties.

CONTENTS

Section I TECHNICAL ABSTRACT BULLETIN from Page 1 to 112 (Printed on white paper). Announces Department of Defense reports released to the public by the Defense Documentation Center. In addition this section includes citations of various articles in non-Government journals, certain Government Printing Office publications, and similar documents of potential interest to Clearinghouse customers. Announcement is made only as a referral service. Readers interested in obtaining copies of these documents should consult the availability statement that accompanies each entry. This section is followed by indexes beginning on page A-1.

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Section II OTHER RESEARCH REPORTS AND RELATED MATERIAL from Page S-1 to S-70 (Printed on blue paper). Announces reports released by AEC, NASA and other civilian agencies and also certain older military reports. Included are AEC's Engineering (CAPE) Drawings, Government-Owned Patents and Privately-Owned Patents in the area of Lubricants. This section is followed by its indexes beginning on page S-71

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02 AGRICULTURE

Includes agricultural chemistry; agricultural economics; agricultural engineering; agronomy and horticulture; animal husbandry; and forestry. See also related field: 06 Biological and Medical Sciences 2, S-2

03 ASTRONOMY AND ASTROPHYSICS

Includes astronomy; astrophysics; and celestial mechanics 3, S-2

04 ATMOSPHERIC SCIENCES

Includes atmospheric physics and meteorology..... 6, S-3

05 BEHAVIORAL AND SOCIAL SCIENCES

Includes administration and management; documentation and information technology; economics; history, law and political science; human factors engineering; humanities; linguistics; man-machine relations; personnel selection, training, and evaluation; psychology (individual and group behavior); and sociology. See also related field: 06 Biological and Medical Sciences..... 9, S-4

06 BIOLOGICAL AND MEDICAL SCIENCES

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07 CHEMISTRY

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08 EARTH SCIENCES AND OCEANOGRAPHY

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09 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes components; computers; electronic and electrical engineering; information theory; subsystems; and telemetry. See also related fields: 10 Energy Conversion (Non-propulsive) and 20 Physics..... 40, S-19

10 ENERGY CONVERSION (Non-Propulsive)

Includes conversion techniques; power sources; and energy storage. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 51, S-21

11 MATERIALS

Includes adhesives and seals; ceramics, refractories, and glasses; coatings, colorants, and finishes; composite materials; fibers and textiles; metallurgy and metallography; miscellaneous materials; oils, lubricants, and hydraulic fluids; plastics; rubbers; solvents, cleaners, and abrasives; and wood and paper products. See also related fields: 07 Chemistry, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 21 Propulsion and Fuels..... 52, S-22

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Includes mathematics and statistics and operations research. See also the specific field of application..... 57, S-27

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

Includes air conditioning, heating, lighting, and ventilating; civil engineering; construction equipment, materials, and supplies; containers and packaging; couplings, fittings, fasteners, and joints; ground transportation equipment; hydraulic and pneumatic equipment; industrial processes; machinery and tools; marine engineering; pumps, filters, pipes, tubing, fittings, and valves; safety engineering; and structural engineering. See also related fields: 07 Chemistry and 09 Electronics and Electrical Engineering..... 63, S-28

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Includes antisubmarine warfare; chemical, biological, and radiological warfare; defense; intelligence; logistics; nuclear warfare; and operations, strategy, and tactics. See also related fields: 16 Missile Technology and 17 Navigation, Communications, Detection and Countermeasures..... 73

16 MISSILE TECHNOLOGY

Includes missile launching and ground support; missile trajectories; missile warheads and fuzes; and missiles. See also related fields: 01 Aeronautics, 17 Navigation, Communications, Detection, and Countermeasures, 19 Ordnance, 21 Propulsion and Fuels, and 22 Space Technology..... 74, S-32

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

Includes acoustic detection; communications; direction finding; electromagnetic and acoustic countermeasures; infrared and ultraviolet detection; magnetic detection; navigation and guidance; optical detection; radar detection; and seismic detection. See also related fields: 09 Electronics and Electrical Engineering and 20 Physics..... 75, S-33

18 NUCLEAR SCIENCE AND TECHNOLOGY

Includes fusion devices (thermonuclear); isotopes; nuclear explosions; nuclear instrumentation; nuclear power plants; radiation shielding and protection; radioactive wastes and fission products; radioactivity; reactor engineering and operation; reactor materials; reactor physics; reactors (power); reactors (non-power); and SNAP technology. See also related fields: 07 Chemistry, 15 Military Sciences, 18 Nuclear Science and Technology, 20 Physics, and 21 Propulsion and Fuels..... 77, S-33

19 ORDNANCE

Includes ammunition, explosives; bombs; combat vehicles; explosions, ballistics, and armor; fire control and bombing systems; guns; rockets; and underwater ordnance. See also related field: 18 Nuclear Science and Technology..... 80, S-53

20 PHYSICS

Includes acoustics; crystallography; electricity and magnetism; fluid mechanics; masers and lasers; optics; particle accelerators; particle physics; plasma physics; quantum theory; solid-mechanics; solid-state physics; thermodynamics and wave propagation. See also related fields: 03 Astronomy and Astrophysics, 07 Chemistry, 09 Electronics and Electrical Engineering, 10 Energy Conversion (Non-propulsive), 11 Materials, 13 Mechanical, Industrial, Civil, and Marine Engineering, and 17 Navigation, Communications, Detection, and Countermeasures..... 80, S-53

21 PROPULSION AND FUELS

Includes air-breathing engines; combustion and ignition; electric propulsion; fuels; jet and gas turbine engines; nuclear propulsion; reciprocating engines; rocket motors and engines; and rocket propellants. See also related fields: 07 Chemistry and 20 Physics..... 108, S-67

22 SPACE TECHNOLOGY

Includes astronautics; spacecraft; spacecraft trajectories and reentry; and spacecraft launch vehicles and ground support. See also related fields: 01 Aeronautics, 03 Astronomy and Astrophysics, 16 Missile Technology, 17 Navigation, Communications, Detection, and Countermeasures, and 21 Propulsion and Fuels..... 110, S-68

TECHNICAL ABSTRACT BULLETIN

1/2. AERONAUTICS

AD-620 899 See Fld. 13/12

AD-620 974 See Fld. 21/7

AD-620 985 See Fld. 17/7

AD-620 989 See Fld. 4/2

AD-621 434 Div. 1/5 ,16/10
CFSTI Prices: HC $2.00 MF $0.50
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
TOLERANCES OF THE HUMAN FACE TO CRASH IMPACT,
by John J. Swearingen. Jul 65, 26p.
AM , 65-20

Unclassified report

Descriptors: (*Aviation injuries, Tolerances (Physiology)), Face, Wounds + injuries, Head, Impact shock, Aircraft seats, Commercial planes, Fractures (Bone), Passenger vehicles, Accidents

Evaluation of the injury potentials of commercial airline seat structures, light-aircraft instrument panels, and other deforming structures requires data on forces that produce fractures, lacerations, or unconsciousness when applied to different parts of the face. Unconscious commercial passengers, although not seriously burned, may asphyxiate or burn to death in a few minutes. Data of facial tolerances of living human heads and forces required to render unconsciousness were gathered by an intensive study of injuries in automobile accidents. These data were checked by making a series of 45 cadaver head impacts against deforming structures. Results show that blows of as low as 30 to 40 g for 10 to 40 milliseconds will produce temporary unconsciousness. Maximum forces that may be tolerated without fracture when the face is impacted gainst a surface that is designed to deform and conform to the contour of the facial bones are: Nose, 30 g; single zygomatic, 50 g; teeth (3.6 sq. in.), 100 g; mandible, 40 g; forehead (1 sq. in.), 80 g; and forehead (4 sq. in.), 150 g. One cadaver head was impacted against a full-face molded block to determine if these tolerances were additive. The impact, the maximum attainable on the equipment (over 300 g), produced no fractures or lacerations. (Author)

AD-621 548 See Fld. 1/4

1/3. AIRCRAFT

AD-620 833 See Fld. 13/8

AD-620 912 Div. 1/7 ,1/3
CFSTI Prices: HC $3.00 MF $0.75
KAYSAM CORP OF AMERICA PATERSON NJ
DESIGN AND FABRICATION OF 100,000-FOOT DUAL-PURPOSE FAST-RISE BALLOON.
Final rept. for 6 Jun 64-5 Jul 65,
by Eric Nelson. 5 Jul 65, 74p. Contract DA28 043AMC00160E Task 1V025001A126 04 10

Unclassified report

Descriptors: (*Balloons, Manufacturing methods), Flight paths, Climbing, High altitude, Aerodynamic characteristics, Balloon equipment, Materials, Quality control

The object is the design and fabrication of a fast-rise balloon assembly apable of reaching altitudes of 100,000 feet by day or by night at not less than 1,700 feet per minute in the daytime and not less than 1,600 feet per minute at night. (Author)

AD-620 936 Div. 1/2 ,11/1
CFSTI Prices: HC $4.00 MF $1.00
GENERAL DYNAMICS CORP GROTON CONN ELECTRIC BOAT DIV
AN EXPERIMENTAL INVESTIGATION OF INTERNAL FLOW EFFECTIVENESS FOR SEVERAL AIR CUSHION VEHICLE ARRANGEMENTS.
Final rept.,
by A. M. Hall. Jul 65, i20p. Rept. no. U-413-65-116
Contract Nonr457600

Unclassified report

Descriptors: (*Ground effect machines, Design), Jets, Gas flow, Thrust, Lift, Vehicles, Logistics, Effectiveness, Configuration, Diffusers, Weight, Fans

An experimental investigation was conducted to determine the effect of planform and fan arrangement on internal distribution efficiency and uniformity of peripheral flow, with application to '5-Ton Payload,' logistic-type air cushion vehicles. The results indicate that overall vehicle effectiveness is highly dependent on the lift distribution system arrangement with maximum efficiencies ranging from 52 to 77 percent. For each configuration, an optimum distribution plenum height is suggested that has a notable similarity to the optimum divergence angle found in conical diffusers. (Author)

AD-620 965 Div. 1/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STABILITY OF A CORRUGATED CYLINDRICAL SHELL LOADED BY AN EXTERNAL PRESSURE,
by V. F. Chizhov, and N. E. Bauman. 1 Jun 65, 21p. Rept. no. FTD-MT-64-518
TT , 65-63906

Unclassified report

Edited machine trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Mashinostroenie (USSR) n3 p35-46 1964.

Descriptors: (*Structural shells, Aircraft), (*Stability, Structural shells), Loading (Mechanics), Pressure, Design, Diaphragms (Mechanics), USSR

In the article there are examined the different variants of structural design solution and the selection of the force diagram depending upon geometric dimensions and magnitude of the external pressure. On the basis of the obtained solution it is shown that under certain relationships of the parameters it is more advantageous, from the point of view of weight, to use shells corrugated in the annular direction of the shell, and stiffened in axial direction by elastic fibers. Results of experimental data on field test-pieces and models are presented. (Author)

AD-620 987 See Fld. 12/1

AD-620 988 Div. 1/3
CFSTI Prices: HC $3.00 MF $0.75
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
METHODS FOR APPLYING MEASURED DATA TO VIBRATION AND ACOUSTIC PROBLEMS.
Final technical rept. for Mar 64-Mar 65,
by Cory L. Gray, and Allan G. Piersol. Jun 65, 97p. Rept. no. MAC-403-09
Contract AF33 615 1418 Proj. 1370 Task 137005
FDL , TR-65-60

Unclassified report

Descriptors: (*Vibration, Data), (*Acoustics, Data), (*Fatigue (Mechanics), Damage), Dynamics, Mathematical prediction, Structural parts, Flight testing

This document discusses various procedures for applying measured vibration and acoustic data to the solution of practical vibration problems. Specific techniques are outlined for using reduced data to establish coherency estimates, frequency response function estimates, structural vibration predictions, and extreme value predictions. Applications to fatigue damage predictions and vibration test specifications are also reviewed. The expected errors associated with the more specific application techniques are detailed. Emphasis is placed upon the determination of appropriate error expressions in terms of sample data parameters. (Author)

AD-621 431 Div. 1/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
EFFECT OF FLAP BLOWING ON THE SECTIONAL CHARACTERISTICS OF AN NACA 0015 AIRFOIL.
Master's thesis,
by Rayford Powell Patrick. Mar 65, 75p. Rept. no. GAM-65A/AE/65-2

Unclassified report

Descriptors: (*Airfoils, Trailing control surfaces), (*Trailing control surfaces, Effectiveness), (*Boundary layer control, Aircraft), Blowers, Design, Lift, Drag, Pressure, Stalling, Friction, Gas flow, Optimization, Model tests, Flowmeters, Angle of attack, Momentum, Separation

Variation of the maximum lift coefficient, the pressure drag coefficient, leading edge and hinge moment coefficients, angle of attack at stall, and slope of lift curves with different momentum coefficients are investigated. The friction drag is investigated and compared to the pressure drag. Also the moment coefficient required to obtain theoretical flap effectiveness at several flap deflections, an optimum flap deflection for largest increase in lift, and an optimum flap deflection for largest percentage increase in lift are investigated.

AD-621 439 Div. 1/3 ,17/5 ,17/6
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
RESEARCH ON CUMULATIVE FATIGUE DAMAGE OF AIRCRAFT STRUCTURAL MATERIALS.
Progress rept. no. 9,
by A. M. Freudenthal. 1 Aug 55, 8p. Contract AF33 616 2274

Unclassified report

Descriptors: (*Airframes, Fatigue (Mechanics), (*Steel, Fatigue (Mechanics)), (*Aluminum alloys, Fatigue (Mechanics)), (*Fatigue (Mechanics), Airframes), Stresses, Tests, Loading (Mechanics), Load distribution, Life expectancy, Experimental data

Tests for the establishment of an S-N diagram for SAE 4340 steel have been completed and their results are presented in Table I. Statistical evaluation of the data and plotting of curves will be carried out as has been done previously for aluminum. Three sets of random tests have been completed using the least severe load distributions A', B', C'. The results are presented in Table II. Since the longest lives obtained in the tests were in the 50,000 cycles range, the advisability of running

791-314 O-65—1

more severe tests is being considered. A revision of the load distributions will probably be made. An attempt was made to perform systematic test on AA7075 Aluminum and SAE 4340 steel submerged in water. A small 1 in long piece of rubber tubing with an internal diameter of 1/4 in is fitted around the reduced (3/16 in) section of specimens, and sealed at the ends. Water is injected with a hypodermic needle. Several preliminary tests were performed using this procedure. The results suggest a considerable reduction in life for both aluminum and steel.

AD-621 515 Div. 1/2 ,9/7
CFSTI Prices: HC $4.00 MF $0.75
WALKER (NORMAN K) ASSOCIATES INC BETHESDA MD
HEAVE STABILITY AND HEAVE DAMPING OF GROUND EFFECT MACHINES - THICK ANNULAR JET AND PLENUM TYPES.
Rept. no. 14 (Final pt. 2), Jun 63-Dec 64,
by Norman K. Walker, and David A. Shaffer.
Jul 65, 122p. Contract DA44 177AMC19T
Proj. 1D021701A04802
USAAVLABS , TR-65-26

Unclassified report

Descriptors: (*Ground effect machines, Motion), Stability, Damping, Jets, Hovering, Lift, Oscillation, Electric propulsion, Aerodynamic characteristics

The report describes an experimental investigation of the heave stability and heave damping characteristics in hovering flight of an electrically powered model Ground Effect Machine, arranged firstly with a thick annular jet and, secondly, as a simple plenum chamber. The lift, rise height and power relationship were determined and the fan characteristics of the thick annular jet were measured. Air was bled from and fed into the air cushion to evaluate the GEM's change in lift. Finally, the machine was allowed to hover at a specific height and then forced to oscillate. From this the heave stiffness and damping ratio were determined. The results show that the physical basis of the theory is correct and that good estimates may be made of the heave characteristics. However, it is suspected that other derivatives may be present, especially in the case of the plenum chamber, where unstable oscillations in a narrow attitude band were observed, and in any case the measured value of 2 damping ratio/undamped frequency in heave was much less than theory would predict. It is considered that the latter result was not due to an unstable fan characteristic, but rather to an instability of flow in the plenum chamber inself. (Author)

AD-621 521 Div. 1/9 ,25/3
CFSTI Prices: HC $4.00 MF $0.75
DYNASCIENCES CORP FORT WASHINGTON PA
THEORETICAL ANALYSIS OF AIRCRAFT ELECTROSTATIC DISCHARGE.
Final rept. for Jun 63-Jan 64,
by Juan de la Cierva, Herbert J. Gillis, and Paul B. Wilson,Jr.. Aug 65, 120p. Rept. no. DCR-132
Contract DA44 177AMC82T Task 1P121401A14130
USAAVLABS , TR-65-53

Unclassified report

Descriptors: (*Static dischargers, Helicopters), (*Helicopters, Static dischargers), Electrical corona, Electrodes, Voltage, Fuselages, Effectiveness

The general problem of aircraft electrostatic charging and one of the more efficient discharger systems presently available are discussed. Methods of discharger system design and analysis are developed and stated for this system. These methods are incorporated into design curves and other data to facilitate and optimize design. The problem of efficient discharge corona electrode design is treated extensively. With the information on corona developed in the report, it becomes possible to include the corona electrode in the system design using conventional engineering design methods. Data permitting optimization of corona electrode performance, that is, current maximization at a given electrode voltage is given. The effects of aircraft altitude are significant on electrode operation. Numerous approaches to the reduction of system voltage requirements are discussed. (Author)

AD-621 552 **See Fld. 11/7**

AD-621 578 Div. 1/2 ,9/7 ,27/2
LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX
LTV LOW SPEED WIND TUNNEL TEST NUMBER 190, FOLLOW-ON TEST OF HIGH MASS RATE VECTORED PROPULSION FLOW MODEL.
Data rept.,
by J. K. Davidson. 31 Jul 65, 200p. Rept. no. 2-53310/5R-2217
Contract DA31 124ARO D262 Proj. ARO D2620E
AROD , 5260:5

Unclassified report

Available only for Reference use at DDC Field Services. Copy is not available for public sale.

Descriptors: (*Vertical take-off planes, Model tests), (*Propulsion, Vertical take-off planes), Thrust, Lift, Pitch (Motion), Wind tunnel models, Tails (Aircraft), Trailing control surfaces, Roll, Drag, Angle of attack, Thrust vector control systems, Graphics

The wind tunnel data resulting from a low speed wind tunnel follow-on test of a semi-span model of a close support, VTOL aircraft is presented. The model features an integrated propulsion/lifting surface system as well as vertical and horizontal tails located on an aft, wing tip extension. The propulsion system exhaust flow, which is simulated with cold air, exhausts over the wing trailing edge flap (flap jet) and out of the lower surface of the wing (wing box jet). The exhaust flows can be independently vectored through 90 degrees with respect to the wing chord plane. The test data are presented in the form of lift and rolling moment coefficients as functions of angle of attack, and drag and pitch moment coefficients as functions of lift coefficient. The coefficient data are given with and without the direct thrust contribution included. The static thrust data are given in the form of lift, drag, pitching moment and rolling moment as functions of angle of attack. Test data with and without ground board effects are presented. (Author)

1/4. AIRCRAFT FLIGHT INSTRUMENTATION

AD-620 964 Div. 1/1 ,11/1 ,30/2
CFSTI Prices: HC $6.00 MF $1.25
GARRETT CORP PHOENIX ARIZ AIRESEARCH MFG DIV
GEM CONTROL SYSTEM STUDY.
Final engineering rept. for Feb 64-May 65,
by Donald E. Litherland, and H. M. Norgren. 16 Aug 65, 217p. Rept. no. AP-5078-R
Contract Nonr3173

Unclassified report

Descriptors: (*Ground effect machines, Simulators), (*Analog computers, Flight control systems), Flight simulators, Electronic equipment, Calibration, Display systems, Design

As reported in AP-5073-R (AD-604 894), prior to 1964, the AiResearch GEM Control System Study consisted of an analog computer dynamic simulation of ground effect machines (GEM's) and a developmental operator's control station, visual generator, and control unit. The primary object of the work performed on this contract since the last progress report was to design, construct, and calibrate a completely universal GEM simulator. (Author)

AD-621 548 Div. 1/1 ,1/4
CFSTI Prices: HC $4.00 MF $1.00
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
AN INVESTIGATION OF THE EFFECT OF SIMPLIFIED EQUATIONS OF MOTION AND VARIOUS INPUTS ON AUTOMATIC-THROTTLE DEVICES.
Master's thesis,
by Ronald E. Evans, and Robert H. Schuppe.
1964, 142p.

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by DDC users. Copy is available for public sale.

Descriptors: (*Airspeed, Control), (*Fighters, Airspeed), Motion, Stability, Airframes, Swept wings, Flight control systems, Simulation, Analog computers, Naval aircraft

This is the second in a series of investigations of automatic-throttle compensation systems. Landing condition speed instabilities are usually associated with modern supersonic aircraft design. The full airframe equations of motion give accurate results but are much too complicated. The simplification of assuming a zero moment of inertia is made. To test the validity, analog computer results are compared with those obtained with the full equations. Attempts are made to gain a better response by sensing different automatic-throttle input variables. (Author)

1/5. AIR FACILITIES

AD-620 986 **See Fld. 11/3**

2/3. AGRICULTURAL ENGINEERING

AD-620 957 Div. 32/1 ,13/3 ,16/4
CFSTI Prices: HC $2.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO WATER CONSERVATION BRANCH
ANNUAL REPORT OF PHREATOPHYTE ACTIVITIES, 1964,
by P. M. Turner. 23 Jun 65, 39p. Rept. no. WC-22

Unclassified report

Descriptors: (*Trees, Control), (*Plants (Botany), Control), (*Water supplies, Control), Ecology, Growth (Physiology), Herbicides, Sprays, Carbohydrates, Evapotranspiration, Forestry, Deserts, Consumption

Objectives of the programs are: (1) to find the most economical means of controlling saltcedar and other phreatophytes in areas of critical water shortage; (2) replacement with vegetation having lower water requirements and preferably with economic value; and (3) management procedures which will assure the survival of the replacement vegetation. Funds spent in the past year and programed for next year are shown. Research contracts have been negotiated with the U. S. Geological Survey and universities of Arizona and Nevada. At Denver, saltcedar (Tamarix pentandra) plants are greenhouse cultured and used as test specimens for foliar applied herbicides. Root samples were analyzed for carbohydrate content to correlate with herbicide effect and growth factors. Helicopter herbicide spraying was performed on 420 acres of saltcedar around Rye Patch Reservoir located north of Lovelock, Nevada. Water measurements are being made in a prototype area located between Bernardo and San Acacia, New Mexico, on the Middle Rio Grande Project. Over 6,000 acres of phreatophytes have been cleared and changes in water use for this area will be determined. (Author)

2/5. ANIMAL HUSBANDRY

AD-621 105 Div. 16/14,16/2
AEROSPACE MEDICAL DIV AIR FORCE SYSTEMS COMMAND BROOKS AFB TEX

EPIZOOTIOLOGY OF STAPHYLOCOCCI IN DOGS,
by Louis Blouse, Paul Husted, Adam McKee, and Judith Gonzalez. 20 Jan 64, 6p.
Unclassified report

Pub. in the American Journal of Veterinary Research, v25 n107 p1195-1200 Jul 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Staphylococcus aureus, Dogs), (*Disease vectors, Staphylococcus aureus), Culture media, Antibiotics, Humans, Veterinary medicine

Of 150 healthy dogs, 63 were intermittent carriers of Staphylococcus aureus: weekly nasal carrier rates varied widely. Although many of the strains isolated from dogs were of phage types associated with infections in man, transmission of staphylococci between dog and man could not be proved during these extended studies. (Author)

AD-621 333 Div. 16/14
ARMY MEDICAL DETACHMENT (51ST) NEW YORK
CANINE EPIHYOID FRACTURES,
by Allan G. Manus. 1965, 4p.
Unclassified report

Pub. in Journal of the American Veterinary Medical Association v147 n2 p129-32 15 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Dogs, Fractures (Bone)), Radiography, Diagnosis, Bone, Cartilage, Connective tissue, Tongue, Throat, Wounds + injuries, Veterinary medicine

Fracture of the right epihyoid bone was found on radiographic examination of 2 sentry dogs. The primary clinical signs were sublingual hematoma and laryngeal swelling. Recovery was uncomplicated in each case. Both dogs were in vigorous training in which a choke chain was employed as the primary means of discipline. (Author)

3/1. ASTRONOMY

AD-620 847 **See Fld. 5/1**

AD-620 882 **See Fld. 18/4**

AD-620 963 Div. 2/1 ,25/4
SYDNEY UNIV (AUSTRALIA)
MEASURING THE STARS. THE STELLAR INTERFEROMETER AT NARRABRI OBSERVATORY,
by R. Hanbury Brown. 1965, 9p. Contract AF AFOSR302 63 Proj. 9774 Task 977401
AFOSR , 65-1115
Unclassified report

Pub. in Scientific Australian v2 n5 p14-20 Feb 1965 (Copies available only to DDC users).

Descriptors: (*Stars, Measurement), (*Interferometers, Astronomical observatories), (*Astronomy, Interferometers), Optical instruments, Australia

The stellar intensity interferometer at Narrabri Observatory is described and its advantages compared to former interferometers. The intensity interferometer is capable of measuring the angular sizes of stars much smaller, hotter, and further away than those measured by other systems. Its advantages are that there is no need for high mechanical precision either in constructing it or guiding it on a star; it does not seem significantly affected by atmospheric scintillation; and measurements are objective and independent of the observer's skill. Development, installation, and initial testing are discussed, and a short theoretical explanation is presented. (Author)

AD-621 000 Div. 2/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HERALD OF THE ACADEMY OF SCIENCES OF THE USSR, 1964, VOL. 34, NO. 5 (SELECTED ARTICLES),
by N. P. Slovokhotov, and N. P. Erpylev. 29 Jun 65, 9p. Rept. no. FTD-TT-65-311
TT , 65-63925
Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Vestnik v34 n5 p126-7, 134-5 1964.

Descriptors: (*Satellites (Artificial), Optical tracking), (*Astronomical observatories, USSR), Symposia

Contents: Conference of representatives of socialistic countries on problems of observing man-made earth satellites, by N. P. Slovokhotov; At the astronomical council (Session of the soviet and its commissions), by N. P. Yerpylev.

AD-621 088 Div. 2/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
FLUX-DENSITY MEASUREMENTS AT 3.15 GC/S; NOTES,
by W. J. Medd, and K. V. V. Ramana. 28 Dec 64, 4p. Rept. no. NRC-8499
Unclassified report

Pub. in Astrophysical Journal v142 n1 p383-6 Jul 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Radio astronomy, Superhigh frequency), (*Astrophysics, Radio astronomy), Ultrahigh frequency, Extraterrestrial radio waves, Stars, Nebulae, Radio equipment, Astronomical observatories

During March-June, 1964, measurements of the flux density of the sources Cassiopeia A, Taurus A, Cygnus A, and the Orion Nebula were made at the Algonquin Radio Observatory. The procedure involved a null balancing technique to minimize possible gain variations; transits with fixed antenna position to eliminate background contributions; and comparison of the recorded source intensities with the emission from heated resistive terminations to establish absolute temperature measurements.

AD-621 193 Div. 2/1 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
SACREMENTO PEAK OBSERVATORY SUNSPOT N MEX
THE BEHAVIOR OF SOME LINES OF RARE-EARTH ELEMENTS ON THE SOLAR DISK,
by N. N. Stefanovich. 1965, 11p. Rept. no. T-13
TT ,AD 65-63958; ,413 920 SUPERSEDED
Unclassified report

Trans. of Akademiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v17, p191-8 1957.

Descriptors: (*Solar spectrum, Rare earth elements), (*Rare earth elements, Solar spectrum), (*Astrophysics, Solar spectrum), Solar flares, Solar atmosphere, Solar radiation, Emissivity, Line spectrum, Absorption spectrum, Band spectrum

The behavior of equivalent widths and half-widths of some lines of rare earth elements on the solar disk was investigated: the center-limb effect, the transition from absorption to emission and the emission in active regions. The variation of the equivalent and half-widths for all the lines, from the center to the limb, was found to be alike and this was compared to that of other non-rareearth elements. The comparison shows that the W-values of the non-rare-earths increase from the center to the limb, while W-values of rare-earth elements decrease. For four lines of rare earth in the wings of H and K of Ca II lines an appearance of emission is observed when approaching the solar limb (about rho = 0.90). These four lines are strengthened in active regions and are observed in emission in some flares and flocculi at large distances from the limb (rho approx 0.65). (Author)

AD-621 195 Div. 2/1 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
SACREMENTO PEAK OBSERVATORY SUNSPOT N MEX
HE I EXCITATION IN CHROMOSPHERIC FLARES,
by N. V. Steshenko, and V. L. Khokhlova. 1965, 24p. Rept. no. T-15
TT ,AD 65-63959; ,413 917 SUPERSEDED
Unclassified report

Trans. of Akaemiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v27 p120-39 1962.

Descriptors: (*Helium, Solar atmosphere), (*Solar atmosphere, Line spectrum), (*Solar flares, Line spectrum), Atomic energy levels, Excitation, Temperature, Gas ionization, Chemical equilibrium, Recombination reactions, X rays, Absorption, Electron transitions, USSR

The study of 11 emission lines of parahelium and orthohelium in the flare of August 30, 1959, and also several lines in other flares, shows that the optical depth of the helium lines is small in the wavelength region 37006700 A of flares observed on the solar disk and at the limb. The population of excited He I levels is derived from the energy of the lines, taking into account the optical depth of non-transparent lines. The line-widths are used for obtaining the upper limit of kinetic temperature in the He I emission region, assuming that line broadening is due only to the thermal velocities of the atoms. The population of the He I levels is computed theoretically. For this purpose the statical equilibrium equations and that of ionization equilibrium are solved for parahelium and orthohelium together. It is shown that excitation by electron impact and recombination can be provided for the observed emission. The possibility of heating of the optical emission region of the flare due to the absorption of X-ray radiation of the flare is considered. The observed flux of X-ray radiation and the energy output of the flare in the ultraviolet and visual spectral regions can be provided for if the color temperature of the core of the flare is approx. 5,000,000K. (Author)

AD-621 196 Div. 2/1 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
SACREMENTO PEAK OBSERVATORY SUNSPOT N MEX
HELIUM EMISSION OF THE CHROMOSPHERIC FLARE OF SEPTEMBER 14, 1958,
by N. V. Steshenjo, and V. L. Khokhlova. 1965, 10p. Rept. no. T-14
TT ,AD 65-63960; ,413 941 SUPERSEDED
Unclassified report

Trans. of Akademiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v23 p322-30 1960.

Descriptors: (*Helium, Solar atmosphere), (*Solar atmosphere, Line spectrum), (*Solar flare, Line spectrum), Atomic energy levels, Excitation, Intensity, Electron transitions, Scattering, Absorption, USSR

The emission lines wavelengths 3965, 5016, 6678, 5876 and 4713 were studied in a flare on the disk. With the exception of wavelength 5876, the above He I lines have no self-absorption. The intensities of optically thin lines were used for the determination of the population of the upper levels of the corresponding transitions and the estimation of the upper limit of population of the lower levels of these transitions. The outer absorbing layer projected on the flare and the self-absorption in the flare were taken into account when interpreting the profile of the D3 line and calculating the population of the 2 (3)P and 3 (3)D levels. It is noted that the scattering of solar radiation cannot play

a decisive role in the excitation of the higher levels of He I in the investigated flare. (Author)

AD-621 197 Div. 2/1 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
SACREMENTO PEAK OBSERVATORY SUNSPOT N MEX
RESULTS OF OBSERVATIONS OF THE CORONAL SPECTRUM OF 19 JUNE 1936.
Solar research note,
by G. A. Shain. 1947, 14p. Rept. no. SRN-T-12
TT , 65-63961

Unclassified report

Trans. of Akademiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v1 pt1 p102-15 1947.

Descriptors: (*Solar spectrum, Solar corona), (*Solar corona, Spectroscopy), (*Astrophysics, Solar corona), Line spectrum, Continuous spectrum, Solar eclipses, Spectrum analyzers, Astronomical data

Chiefly, the results of spectrophotometric study of emission lines in the spectrum of the inner corona are cited: (1) The total intensity of emission lines changes from one coronal region to another and from eclipse to eclipse; (2) a comparison of spectrophotometric measurements of spectra for 1929 and 1936 reveals considerable difference with respect to intensity of emission lines (for example 5303, 6374, 3801, 3987 and 4086); (3) the decrease in intensity of emission lines with distance from the edge of the disk is not proportional to the corresponding decrease of intensity of the continuous spectrum; gradients are considerably higher for lines, with the exception probably, of 4231; (4) the observed deviation in curves of intensity changes in lines and in the continuous spectrum with distance from the edge of the disk should be attributed, first of all, to local effects; (5) the validity of the observed retardation in the growth of intensity of emission lines, or even the decrease of intensity within limits 0-1', is doubtful. One can suspect the presence of a decrease in intensity for distances less than 0'.5 only on the basis of indirect reasoning; (6) a change in the intensity of the continuous spectrum within 1-6' does not show appreciable dependence on wave length; (7) the density of matter responsible for the continuous spectrum (electrons) changes from 1.6 X 10 to the 8th power to 0.3 X 10 to the 8th power within 1'.5--5'.5. The corresponding change of particles responsible for emission lines is 6-7 times greater. (Author)

AD-621 198 Div. 2/1 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
SACREMENTO PEAK OBSERVATORY SUNSPOT N MEX
THE SEQUENCE OF APPEARANCE OF LINES OF DIFFERENT ELEMENTS IN FLARES.
Solar research note,
by N. N. Stepanyan. 1961, 5p. Rept. no. SRN-T-16
TT , 65-63962

Unclassified report

Trans. of Akademiya Nauk SSSR. Krymskaya Astrofizicheskaya Observatoriya. Izvestiya, v26 p41-4 1961.

Descriptors: (*Astrophysics, Solar flares), (*Solar flares, Line spectrum), Solar atmosphere, Rare earths, Spectra (Visible + ultraviolet)

The sequence of appearance of lines of different elements in flares is studied. It is found that the brightness maximum of flares in lines of rare earths appears a few minutes later (about 5 minutes) than the maximum in lines of such metals as Mg, Fe, Al. This effect can be explained by the emission of a flare in the upper chromospheric layers reaching, with some retardation, the lower chromosphere, where the rare earths are mainly localized. (Author)

AD-621 241 Div. 2/1 ,20/2
CFSTI Prices: HC $4.00 MF $0.75
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL WASHINGTON D C COMMITTEE ON NUCLEAR SCIENCE
PROBLEMS RELATED TO INTERPLANETARY MATTER.
Nuclear Science Series.
1961, 115p. Rept. no. NAS-NS-33 Pub-845
Contract AF49 638 751
AFOSR , 721

Unclassified report

Proceedings of an Informal Conference (4th) at Highland Park, Ill., 20-22 Jun 60.

Descriptors: (*Solar systems, Space environmental conditions), (*Space environmental conditions, Nuclear physics), (*Astrophysics, Symposia), (*Nuclear physics, Space environmental conditions), Helium group gases, Meteorites, Cosmic rays, Space probes, Geologic age determination

CONTENTS: The origin of the solar system; Comments on the time dependence of nucleo-synthesis; Xenon in stone meteorites; Primordial argon and neon in stone meteorites; Cosmic ray ages of iron meteorites; Argon-37, Argon-39 and tritium in recent meteorite falls; The distribution of rare gases in iron meteorites; Cosmic ray production of radioactive nuclides in iron meteorites; Cosmogenic nuclides in the hamlet meteorite; The high energy cosmic ray spectrum; Lower energy cosmic rays and the solar cycle; On the geophysical and geonuclear significance of the earth's radiation belts; Micrometeorite studies from earth satellites; Exploration of the moon and planets; Diamonds in meteorites; Heavy-element activation analyses of meteorites; Strontium and rubidium in stone meteorites; Secular changes in the concentration of atmospheric radiocarbon; Radium-uranium age determinations on marine shells; and Oxygen isotope measurements in glacial ice.

AD-621 245 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
ARIZONA UNIV TUCSON LUNAR AND PLANETARY LAB
LUNAR AND PLANETARY RESEARCH.
Final rept.,
by T. Gehrels. 30 Sep 65, 2p. Contract Nonr G00075 64

Unclassified report

See also AD-614 169, AD-614 170.

Descriptors: (*Mars, Optical properties), (*Venus, Optical properties), (*Moon, Optical properties), (*Astronomy, Optical scanning), Spectroscopy, Optical analysis, Spectra (Infrared), Spectra (Visible + ultraviolet), Lunar environment, Mercury (Planet), Planets, Surface properties, Scientific research

Polarization of Venus and Mars at 7 wavelengths was observed. Measurements of Venus from 1959 to 1965 show fairly good repetition when observed with infrared, red, and green filters. With the ultraviolet filters, however, appreciable differences are found from year to year. The differences are presumably caused by variations in the optical thickness of the molecular atmosphere above the cloud layers. Observations were made with the 21-in. reflectors of the Steward Observatory in Tucson and the Lunar and Planetary Laboratory in the Santa Catalina Mountains north of Tucson. For both telescoped and instrumental polarization was determined by observations on nonpolarized stars. A few strongly polarized stars were also observed. A good set of measurements was obtained on the polarization of Mercury. Polarization of the whole moon was observed by using the photometers with a one-inch lens instead of the usual telescope.

AD-621 298 Div. 2/1
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV BERKELEY DEPT OF ASTRONOMY
PLANETARY AND STELLAR ATMOSPHERES: MARS AND MIRA.
Final rept.,
by Hyron Spinrad. 1965, 3p. Contract Nonr G00019 65 Proj. NR046 811

Unclassified report

Descriptors: (*Planetary atmospheres, Mars), (*Mars, Planetary atmospheres), (*Stars, Atmosphere), (*Astrophysics, Planetary atmospheres), Spectroscopy, Astronomical data

AD-621 314 **See Fld. 4/2**

AD-621 341 Div. 2/1 ,25/7
PRINCETON UNIV N J OBSERVATORY
THE INFRARED SPECTRUM OF THE MOON,
by Richard B. Wattson, and Robert E. Danielson.
1 Mar 65, 8p.

Unclassified report

Pub. in The Astrophysical Journal v142 n1 p16-22 1 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Moon, Infrared spectroscopy), (*Infrared spectroscopy, Moon), Balloons, Albedo (Astronomy), Emissivity, Astronomy, Solar radiation, Reflection, Spectra (Infrared)

During the second flight of Stratoscope II, the infrared spectrum of the Moon (Mare Tranquilitatis) was traced from 0.8 microns to 3.0 microns at a balloon altitude of 83500 feet. The intensity of the reflected solar radiation was found to decrease from 0.8 microns to about 2.5 microns where the Moon's thermal emission becomes significant. The computed radiance factor (phase angle = 53 degrees) increases smoothly from about 4 per cent at 1 micron to about 12 per cent at 2.3 microns, indicating that the lunar albedo is substantially higher in the infrared than in the visual. (Author)

AD-621 356 Div. 2/1 ,2/2
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
THE SELENODETIC CONTROL SYSTEM OF THE AERONAUTICAL CHART AND INFORMATION CENTER OF THE U. S. AIR FORCE.
Mathematical note,
by C. L. Goudas. Jun 65, 34p. Rept. no. MN-413 ,D1-82-0443

Unclassified report

Descriptors: (*Moon, Mapping), (*Mapping, Moon), (*Astronomy, Moon), Extraterrestrial topography, Configuration, Surveying, Special functions (Mathematical), Air Force research, Lunar environment

Values of the coefficients J sub ij and J' sub ij of the expansion into spherical harmonics of the surface of the Moon as this is presented by the Selenodetic Control System of the Aeronautical Chart and Information Center, (ACIC), of the U. S. Air Force, are derived. Data for the Marginal Zone are taken from the maps of Watts and Hayn and the measurements of Davidson and Brooks. It is found that the present values are in good agreement with those derived on the basis of the same data derived by Schrutka-Rechtenstamm and the Army Map Service. The ACIC Control system approximates best the figure of the Moon as this is derived from the study of its physical libration on the assumption of homogeneity. (Author)

AD-621 374 Div. 2/1 ,2/7
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
2800 MEGACYCLE PER SECOND RADIATION ASSOCIATED WITH TYPE II AND TYPE IV SOLAR RADIO BURSTS AND THE RELATION WITH OTHER PHENOMENA,
by Gladys A. Harvey. 8 Feb 65, 17p. Rept. no. NRC-8544

Unclassified report

Pub. in Journal of Geophysical Research v70 n13 p2961-76 Jul 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Solar flares, Radio astronomy), (*Radio astronomy, Solar flares), (*Astrophysics, Solar flares), Extraterrestrial radio waves, Ultrahigh frequency, Ionospheric disturbances, Magnetic storms, Solar disturbances, Correlation techniques, Geophysics, Atmosphere

Emission at 2800 Mc/s (lambda = 10.7 cm) has been examined for 164 solar flare events in 1957-1961 that displayed type II and/or type IV emission at meter wavelengths. Characteristics of the centimeter bursts are presented and discussed in relation to the meter bursts, flares, the magnetic class of the associated sunspots, ionospheric disturbances (SWF), and geomagnetic and solar proton (PCA) effects. No centimeter bursts were detected for 13% of the events; bursts with an impulsive profile were observed for 82% of the events. Of the impulsive bursts, 74% reached maximum quickly, displaying a simple, narrow burst profile (average halfwidth 1.8 minutes); the rest had complex profiles containing a predominant broad component (average halfwidth 17 minutes). The narrow profile bursts are considered to be M type, and the broad profile bursts to evidence type IV emission. The majority of the narrow profile centimeter bursts corresponded to events in which only a type II burst was observed at the meter wavelengths. When type IV bursts were observed at the meter wavelengths, narrow profile centimeter bursts were seen in 43% of the cases and broad profile bursts in 57%. A strong association with magnetically complex sunspots, flares of importance > or = 2 (+) SWF of importance > or = 3 (-), geomagnetic storms, and PCA was found for only those events in which the centimeter burst had a broad profile. (Author)

AD-621 391 Div. 2/1 ,25/7 ,25/5
STRAWBRIDGE OBSERVATORY HAVERFORD COLLA
WAVE FUNCTIONS FOR THE EXCITED STATES OF NATURAL HELIUM.
Revised ed.,
by Louis C. Green, Eleanor K. Kolchin, and Norma C.Johnson. 4 Mar 65, 7p. Contract Nonr172700 Grant ,NsG287

Unclassified report

Pub. in The Physical Review v139 n2A pA373-8 19 Jul 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 30 Jul 64.

Descriptors: (*Excitation, Helium), (*Helium, Functions), Electron transitions, Probability, Quantum mechanics, Calculus of variations, Ultraviolet spectroscopy, Astrophysics

Wave functions have been found for the excited states of neutral helium for the 1S, 3S, 1P, 3P, 1D, and 3D series up through terms for which the principal quantum number of the running electron is 9 for the S series and 8 for the others. The wave functions are obtained from the minimum principle by a configuration-interaction procedure. At the final stage of the calculation, the wave functions are found by the solution of a secular equation of order 9 X 9 or less. If one excludes the energy of the (1)1S term, the average agreement between computed and observed energies for the 42 remaining terms is better than 1 part in 300,000. The energies gotten for the more highly excited states appear to be more than an order of magnitude, better than any which have been previously obtained. The values of the parameters in the various wave functions are made available. (Author)

AD-621 394 Div. 2/1
LINCOLN LAB MASS INST OF TECH LEXINGTON
RADAR DETERMINATION OF THE ASTRONOMICAL UNIT,
by Irwin Shapiro. 1963, 41p.

Unclassified report

Pub. in Astronomique Bulletin v25 n2 p177-215 1963 (Copies available only to DDC users).

Descriptors: (*Radar equipment, Range finding), (*Range finding, Astronomy), (*Astronomy, Range finding), Venus, Ranges (Distance), Radar pulses, Radar reflections, Light, Doppler effect, Measurement

A comprehensive review is given of the Earth-Venus measurements made with the Lincoln Laboratory Millstone radar in 1959 and 1961. The time-delay and Doppler shift data yield a value for the Astronomical Unit of 499.0052 = 0.001 light sec. Using 299 792.5 km/s for the speed of light leads to an AU of 149 598 000 = 300 km. With the radius of Earth taken as 6 378.15 km, the solar parallax then becomes 8 min.79416 = 0 min.00002. This value is consistent with measurements made at various other laboratories to about one part in 100,000. (Author)

AD-621 395 Div. 2/1
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
A DYNAMICAL MODEL FOR KORDYLEWSKI CLOUD SATELLITES.
Revised ed.,
by Frederick V. Pohle. 16 Jul 64, 5p. Contract DA11 0220RD2059
AFOSR , 65-1358

Unclassified report

Pub. in AIAA Journal v2 n10 p1818-20 Oct 1964 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Adelphi Univ., Garden City, N. Y., Grant AF AFOSR598 64.

Descriptors: (*Solar systems, Nebulae), (*Nebulae, Solar systems), (*Celestial mechanics, Nebulae), (*Astronomy, Nebulae), Dynamics, Models (Simulations), Dust, Clouds

In the earth-moon system it is known that the Lagrangian equilateral triangular points (L sub 4, L sub 5) are stable points and that matter may remain for a long time in the regions close to such points. In order to seek the existence of natural satellites in such regions, a search was undertaken by K. Kordylewski of the Cracow Observatory in Poland a number of years ago. Success was announced with the statement that a pair of thin cloud-like satellites was observed near each stable L point. The object of the present note is to suggest a possible dynamical model to explain the accumulation in the form of clouds observed by Kordylewski.

AD-621 405 Div. 2/1 ,25/4
PRINCETON UNIV N J OBSERVATORY
INFRARED SPECTRA OF RED-GIANT STARS,
by N. J. Woolf, M. Schwarzschild, and W. K. Rose. 27 Jul 64, 20p. Contract Nonr185803 Grant ,NSF G14905

Unclassified report

Pub. in The Astrophysical Journal v140 n3 p833-52 1 Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stars, Spectra (Infrared)), (*Astrophysics, Spectra (Infrared)), (*Spectra (Infrared), Astrophysics), Infrared telescopes, Airborne, Balloons, Astronomical data, Tables

The second flight of Stratoscope II was carried out during the night of November 26, 1963. The telescope was equipped with an infrared spectrometer with a useful sensitivity range from 1 to 3 micron. The balloon operations were carried out without difficulty. The telescope was operated from 6 P.M. to 6 A.M. Spectral tracings were obtained for ten objects. This paper reports on the observations of six nearby red-giant stars. The spectra of the hotter objects showed that the terrestrial atmosphere above the balloon had no disturbing effects on the measurements. The only terrestrial band weakly indicated in the spectra is that of carbon dioxide at 2.7 micron. The spectrum of alpha Tau (K5) shows practically no bands but has a clear intensity peak around 1.6 micron where bound-free and free-free absorption of H (-) and H2 (-) leaves a relatively transparent region in the continuous absorption coefficient. The same phenomenon is shown in the spectra of the cooler stars although complicated by band structure. Water-vapor absorption bands at 1.4 and 1.9 micron appear distinctly in the spectrum of the supergiant alpha Ori (M2). These bands occur with a similar strength in the spectrum of rho Per (M4), but are weaker in micro Gem (M3). In the spectrum of R Leo (M8, m sub v = 7.9) and particularly of omicron Cet (M9, m sub v = 8.4) the water-vapor bands at 1.4, 1.9, and 2.7 micron are extremely strong. (Author)

AD-621 438 **See Fld. 13/2**

AD-621 444 Div. 2/1 ,25/4
PRINCETON UNIV N J OBSERVATORY
INFRA-RED SPECTRA OF STARS, PLANETS AND THE MOON FROM STRATOSCOPE II,
by N. J. Woolf. 30 Oct 64, 8p.

Unclassified report

Pub. in Annales d'Astrophysique v28 n1 p218-24 Jan-Feb 1965 (Copies available only to DDC users).

Descriptors: (*Spectra (Infrared), Astrophysics), (*Astrophysics, Spectra (Infrared)), Stars, Mars, Jupiter, Moon, Balloons, Astronomy

Two flights of the balloon borne telescope Stratoscope II have been made for infra-red spectroscopic observations. The paper summarises the results of observing cool stars, Mars, Jupiter and the Moon. (Author)

AD-621 468 Div. 2/1
PRINCETON UNIV N J OBSERVATORY
SUNSPOTS: THEORY,
by Robert E. Danielson. 1965, 21p.

Unclassified report

Rept. on Stellar and Solar Magnetic Fields. International Astronomical Union Symposium (22th), held in Rottach-Egern near Munich, Germany 3-10 Sep 63 (Copies available only to DDC users).

Descriptors: (*Sunspots, Theory), (*Astrophysics, Sunspots), Magnetohydrodynamics, Solar atmosphere, Magnetic properties, Optical properties, Mathematical models

This introductory lecture on the theory of sunspots consists of three parts. The first part is devoted to a discussion of some pertinent sunspot observations. The second part reviews hydromagnetic stability calculations which are applicable to sunspots. Two recent theoretical sunspot models are discussed in the third part. (Author)

AD-621 535 Div. 2/1 ,25/4
CALIFORNIA UNIV LOS ANGELES
THE HYDROGEN TO HELIUM RATIO IN HD96446,
by Anne Cowley, L. H. Aller, and Theodore Dunham,Jr.. 1963, 8p. Contract AF AFOSR83 63

AFOSR , 65-1105

Unclassified report

Pub. in Publications of the Astronomical Society of the Pacific v75 n446 p441-47 Oct 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stars, Spectra (Visible + ultraviolet), Line spectrum, Hydrogen, Helium, Tables

In order to make a detailed study of the spectrum a number of spectra were secured with the 32-inch camera of the coude spectrograph on the 74-inch reflector at the Mount Stromolo Observatory. Two gratings were used for the region 3600-4800 A: (1) a Bausch and Lomb second-order grating with 600 grooves/mm, and (2) a Mount Wilson-Palomar third-order grating with 600 grooves/mm. These gratings produced spectra with dispersions of 10.0 A/mm and 6.7 A/mm, respectively. One of the two wedge-spectra gave reasonably consistent and reproducible results, and this was used for obtaining preliminary equivalent widths of the

stronger lines. Equivalent widths of the stronger lines on the photoelectric scans were measured. The list of coude observations of HD96446 is given. The equivalent widths (W sub lamda) determined from coude plates and from photoelectric spectral scans is given.

AD-621 575 Div. 2/1
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH
ROUTH'S CRITICAL MASS RATIO AT THE TRIANGULAR LIBRATION CENTERS.
Mathematical note,
by Andre Deprit. Jul 65, 48p. Rept. no. MN-416 ,D1-82-0453

Unclassified report

Also available from the author.

Descriptors: (*N-body problem, Celestial mechanics), (*Celestial mechanics, N-body problem), Hamiltonian, Series, Numerical analysis, Programming (Computers)

Routh's criterion concerning the existence of periodic solutions around the triangular libration centers is shown to be valid only at the first order. For mass ratios greater than Routh's critical value, the analytical relations between the mass ratio and the lower bound of the orbital parameter is expanded in power series up to the fourteenth order. The corresponding d'Alembert series representing the limiting periodic orbits up to the same order are used to provide approximate initial conditions for a numerical integration method. For mass ratios as high as 0.044 (in canonical units), the Jacobi constant of the limiting orbits is a slightly increasing function of the mass ratio; their characteristic exponents are of the stable type. As the mass goes on increasing, the multipliers keep moving on the unit circle in the complex plane from the real unit point to its opposite. The orbits evolve from infinitesimal ellipses centered at L sub 4 into large size asymmetrical ovals around that point. (Author)

AD-621 624 Div. 2/1 ,25/5
PALMER PHYSICAL LAB PRINCETON UNIV N-J
ICARUS AND RELATIVITY.
Technical rept.,
by R. H. Dicke. 5 Apr 65, 3p. Contract Nonr185830 Proj. NR019 627

Unclassified report

Pub. in Astronomical Journal v70 n6 p395-6 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Asteroids, Relativity theory), (*Relativity theory, Asteroids), Gravity, Field theory, Sun

The regression of the node of Icarus is proposed as a sensitive measure of the oblateness of the sun. (Author)

4/2. METEOROLOGY

AD-620 847 See Fld. 5/1

AD-620 870 Div. 2/7 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
NORWEGIAN INST OF COSMIC PHYSICS UNIV OF OSLO
MULTI-CHANNEL EQUIPMENT FOR RECORDING VLF-EMISSIONS IN THE FREQUENCY-RANGE 2-16KC/S.
Scientific rept.,
by L. Harang, R. Larsen, and J. Skogtvedt. 25 Apr 65, 14p. Rept. no. SR-1
Contract AF61 052 811
AFCRL , 65-512

Unclassified report

Descriptors: (*Atmospherics, Electronic recording systems), Very low frequency, Radio waves, Radio reception, Radio equipment, Geophysics, Magnetic storms, Meteorological phenomena, Norway

The preliminary results of recordings of VLF-emissions at Tromso (phi = 69 deg 40 min N, lambda = 18 deg 57 min E Gr) in the frequency range 2 - 16 kc/s are presented, using five-channel equipment with center frequencies at 14.7, 12.3, 7.2, 4.7 and 2.3 kc/s. The power spectral densities of typical burst events were measured at each of the five center frequencies. At the lowest frequency no amplitude, or very faint amplitudes appeared. In the band 4 - 7 kc/s the densities were of the order 10 x 10 to the minus 16th power w/sq m c. On 15 kc/s the density had increased to 60-70 x 10 to the minus 16th power w/sq m c, there is thus an increase of 3-5 times. The center frequency of the emissions therefore lies at a higher frequency than 15-20 kc/s. (Author)

AD-620 896 Div. 2/7 ,9/1
CFSTI Prices: HC $4.00 MF $0.75
RAND CORP SANTA MONICA CALIF
ELABORATION OF HOCKING'S HYDRODYNAMIC THEORY,
by C. L. Olson. Sep 65, 119p. Rept. no. RM-4715-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Clouds, Hydrodynamics), (*Hydrodynamics, Raindrops), Viscosity, Particle trajectories, Spheres

As a step towards a definitive solution of the collision efficiency problem of two spheres falling in a viscous medium, L. M. Hocking's unpublished Ph.D. thesis (University of London, 1958) is examined. The resulting infinite sets of equations that must be solved for the forces on the spheres are found to be correct. This Memorandum shows, however, that Hocking's solution of these equations have large errors if the spheres are close together. A suitable method for solving the equations is developed, as in a procedure for accurately determining the errors. (Author)

AD-620 919 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
MICHIGAN UNIV ANN ARBOR DEPT OF METEOROLOGY AND OCEANOGRAPHY
AN ATTEMPT TO DEVELOP A CLIMATOLGY OF ICE ACCRETION.
Final rept. for 1 Nov 62-31 Jul 64,
by E. S. Epstein. Jun 65, 23p. Rept. no. 05451-1-F
Contract AF19 628 1693 Proj. 8624 Task 862402
AFCRL , 65-584

Unclassified report

Descriptors: (*Climatology, Freezing), (*Ice, Climatology), Meteorological parameters, Atmospheric precipitation, Correlation techniques

An attempt is made to develop a method for producing a climatology of ice accretion. It is found that the available data are not sufficient to produce such a climatology. A method is presented by which a climatology of occurrences of freezing precipitation could be derived, principally from standard radiosonde information. The principal statistical tool employed is multiple discriminant analysis. Were adequate quantitative data on ice accretion to become available at even a limited number of locations the method could be extended to provide the desired climatology. (Author)

AD-620 952 Div. 2/7 ,20/3
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
DETERMINATION OF THE D-LAYER AIR CHEMISTRY FROM A DAYTIME, HIGH-ALTITUDE NUCLEAR EXPLOSION,
by R. E. LeLevier. Sep 65, 12p. Rept. no. P-3186

Unclassified report

Prepared for publication in the Journal of Geophysical Research.

Descriptors: (*Atmospheric sounding, Nuclear explosions), (*Nuclear explosions, Atmospheric sounding), High altitude, Fission products, X rays, Ionosphere, Electrons, Ions, Recombination reactions, Electron density, Solar radiation, Geophysics

Measurements of the magnitude and time dependence of X-ray induced absorption over Midway during the July 9, 1962, high-altitude nuclear explosion allowed us to infer bounds on the dissociative recombination coefficient alpha of the D-layer of the ionosphere. It is shown here that a daytime experiment would allow a unique determination of alpha. By combining the daytime data with the already available nighttime data, one could infer the in situ detachment rate of the daytime ionosphere. We find that a low-yield explosion (a few KT) is adequate for the purpose of the experiment. (Author)

AD-620 989 Div. 2/7 ,1/4
CFSTI Prices: HC $2.00 MF $0.50
EASTERN AIR LINES INC MIAMI FLA METEOROLOGY DEPT
FLIGHT DATA ANALYSIS OF THE RELATIONSHIP BETWEEN ATMOSPHERIC TEMPERATURE CHANGE AND CLEAR AIR TURBULENCE.
Final rept.,
by Paul W. Kadlec. Jun 65, 49p. Contract Cwb10888

Unclassified report

Descriptors: (*Atmospheric temperature, Turbulence), (*Turbulence, Atmospheric temperature), (*All-weather aviation, Weather forecasting), (*Weather forecasting, All-weather aviation), Atmospheric sounding, Aircraft, Flight paths, Meteorological parameters, Correlation techniques, Air mass analysis

Certain atmospheric temperature changes have been observed to be a factor in detecting the occurrence of clear air turbulence, especially at jet altitudes above 25,000 feet. Data for this study were collected on 146 flights during the year while riding as an extra crew member in the cockpit of airline and military jet aircraft. An aircraft flight data recorder which was modified to collect static air temperature information, provided another valuable source of research data. The study concentrated on investigating the validity of the theory that temperature gradients may be used to indicate clear air turbulence. A comparison between several rates of temperature change was made in an effort to determine which would indicate actual flight conditions most efficiently. From flight observations using a portable test instrument to detect temperature changes and the flight recorder data, a rate of temperature change of 1.0C per minute was found to be the most useful criterion for correctly indicating flight conditions in the majority of cases. The aircraft instrumentation in the research program included a portable test instrument as well as the normal components of an air data system and temperature sensors. The flight recorder and air data system on one DC-8 were modified to collect static air temperature information on the flight data recorder using an improved temperature sensor. In addition, a vertical acceleration indicator located on the cockpit instrument panel provided an instantaneous objective measurement of turbulence intensity on this DC-8. (Author)

AD-620 996 Div. 2/7 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR MEASURING THE DENSITY AND MOBILITY OF IONS IN THE ATMOSPHERE,
by Yu. A. Bragin. 29 Jun 65, 7p. Rept. no. FTD-TT-65-207
TT , 65-63921

Unclassified report

Unedited rough draft trans. of Patent (USSR) 154 066, appl. no. 780714/26-10, 31 May 62.

Descriptors: (*Meteorological instruments, Atmospheric sounding), (*Atmospheric sounding, Telemeter systems), (*Telemeter systems, Atmospheric sounding), (*Ions, Upper atmosphere), Measuring devices (Electrical + Electronic), Charged particles, Sounding rockets, USSR

The device consists of two screened sieve-shutters placed in the inner cavity of a cylindrical intake attachment at a definite distance one from the other and perpendicular to its axis. The sieve-shutters are intended for measuring the speed of the the drift of the charged particles by which afterwards there is calculated the mobility of these particles. The sieve-screens are intended for screening the effect of the electrical fields inside of the intake attachment on the outer medium and form a uniform electrical field in the area to be analyzed. The sieve-shutters represent tungsten filament-electrodes onto which there passes an alternating voltage creating a transverse electrical field attracting to itself electrons and ions in the course of all the time except moments of the passing through of a curve of alternating voltage, through a tension which is zero with relation to a given point of space. The sieve-shutters are connected up to a generator of AC, the frequency of which changes periodically with the aid of the commutator of frequency. On the bottom of the intake attachment there is fastened the collector, which catches the charged particles after they have passed through the two sieve-shutters. The ion flux is recorded by the electrometer, to the output of which there is connected the radio transmitter, which transmits to the earth the indications of the electrometer.

AD-621 030 See Fld. 14/2

AD-621 073 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
ARCTIC METEOROLOGY RESEARCH GROUP MCGILL UNIV MONTREAL (QUEBEC)
THE BEHAVIOUR OF PLANETARY WAVES IN AN ATMOSPHERIC MODEL BASED ON SPHERICAL HARMONICS.
Scientific rept.,
by Andre Robert. Jun 65, 91p. Rept. no. 77 SR-1
Contract AF19 628 4955 Proj. 8628 Task 862807
AFCRL , 65-488

Unclassified report

Descriptors: (*Atmospheric tides, Mathematical models), (*Special functions (Mathematical), Atmosphere models), Weather forecasting, Mathematical prediction, Atmospheric motion, Jet streams (Meteorology), Harmonic analysis

The grid point method commonly used in numerical calculations presents serious problems in experiments that require a global coverage of the meteorological variables. The shape of the earth and the form taken by the meteorological equations in a system where longitude and latitude are the basic coordinates, suggest the use of spherical harmonics for the horizontal specification of the variables. This method eliminates grid points and all the truncation errors due to the finite difference approximations. It also permits the retention of all the terms in the meteorological equations including those that would normally exhibit an anamalous behaviour near the poles. A model based on five levels and 15 coefficients was integrated for 200 days starting from an atmosphere at rest. The integration was then continued for another 20 days with 45 coefficients. Cross-sections show a jet stream in each hemisphere and low level easterlies along the equatorial belt. The amplitudes, the phase speeds and the structure of the planetary waves in the model compare favourably with their atmospheric equivalents. The results of this integration indicate that spherical harmonics could be used profitably in general circulation models and for the preparation of extended range forecasts. (Author)

AD-621 087 See Fld. 9/5

AD-621 153 Div. 2/7 ,24/2
CFSTI Prices: HC $3.00 MF $0.75
MCGILL UNIV MONTREAL (QUEBEC) STORMY WEATHER GROUP
MEASUREMENTS ON NEW-FALLEN SNOW.
Scientific rept.,
by K. L. S. Gunn. Aug 65, 56p. Rept. no. MW-44 ,SR-5
Contract AF19 628 249 Proj. 8620 Task 862004
AFCRL , 65-554

Unclassified report

Descriptors: (*Snow, Measurement), (*Meteorological instruments, Photographic recording systems), (*Photographic recording systems, Meteorological instruments), Atmospheric precipitation, Meters, Meteorology, Climatology

The rate of accumulation of snow at the ground has been recorded by photographing the snow surface against a wire grid. The records have provided useful data about amounts and rates of snowfall at Montreal. Of 101 snowstorms considered, half deposited less than 2 mm of water (mmw). During a winter there are only half a dozen storms that deposit more than 10 mmw (4 inches of snow). Half the amount of snow in a season comes at rates of 1.2 mmw/hr and less. The highest rate measured in two winters was 7.4 mmw/hr over a period of one-half hour. The snow surface is continually subsiding at a rate generally less than 1 mm of snow per hour. The subsidence is due to the compacting of the snow cover presumably as the crystals become modified in their new environment. The rate of compacting of any layer in the new snow is found to be about 1 per cent per hour, independent of the snow density. Many measurements of the snowfall rate R and the average mass per crystal m have provided values of R/m, the number of snow crystals reaching unit area of the surface per unit time. A typical number is 1 per cent sq cm per sec. Over a whole season's data, the flux is proportional to the snowfall rate. Specifically, two thirds of the measurements lie within a factor two of a locus R/m/sq cm sec) = 1.5 R (1.0) where R is in mmw/hr. (Author)

AD-621 155 Div. 2/7 ,12/1
CFSTI Prices: HC $3.00 MF $0.75
MIAMI UNIV CORAL GABLES FLA INST OF MARINE SCIENCE
MESO-SCALE SYNOPTIC ANALYSIS OF RADAR AND SATELLITE METEOROLOGICAL DATA.
Final rept.,
by H. W. Hiser, and H. V. Senn. Feb 65, 58p.
Rept. no. ML-65167 ,8261-2
Contract Cwb10622

Unclassified report

Descriptors: (*Meteorological satellites, Weather forecasting), (*Meteorological radar, Weather forecasting), (*Weather forecasting, Meteorological satellites), Meteorologocal parameters, Cloud cover, Infrared photography, Radar echo areas, Tropical cyclones, Photogrammetry, Florida

Nine case studies are presented in which rectified Tiros photographs of cloud patterns over the South Florida region are correlated with synoptic weather data and radar observations of precipitation on the meso scale. Tiros V, VI and VII data from August 1962 through October 1963, including hurricane Ginny, were used in the study. Previous work in the development of an optical rectification and gridding system for satellite photographs is summarized. Also, this rectification system is further evaluated as to accuracy and applications. (Author)

AD-621 178 Div. 2/7 ,13/4
CFSTI Prices: HC $1.00 MF $0.50
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION MELBOURNE (AUSTRALIA) DIV OF BUILDING RESEARCH
ESTIMATION OF SOLAR RADIATION IN AUSTRALASIAN LOCALITIES ON CLEAR DAYS.
Technical paper,
by J. W. Spencer. 1965, 20p. Rept. no. TP-15

Unclassified report

Descriptors: (*Australia, Solar radiation), (*Solar radiation, Mathematical prediction), Buildings, Civil engineering

The derivation of empirical relations expressing direct and diffuse solar radiation as functions of solar altitude and angle of incidence from measurements made in Melbourne is described, and methods are suggested for calculating direct and diffuse solar radiation on horizontal, vertical, and sloping surfaces in other Australasian localities. Clear-sky conditions only are dealt with but methods are available (Tonne and Normann 1959; Page 1961) for estimation of the radiation on cloudy days using clear-sky data and hours of sunshine. The transmission of direct solar radiation through glass is also considered. (Author)

AD-621 233 Div. 2/7 ,2/6
LINCOLN LAB MASS INST OF TECH LEXINGTON
MIDLATITUDE IONOSPHERIC TEMPERATURES ON MAGNETICALLY QUIET AND DISTURBED DAYS.
by John V. Evans. 11 Jan 65, 8p. Rept. no. JA-2512
Contract AF19 628 5167
ESD , TDR-65-324

Unclassified report

Pub. in Journal of Geophysical Research v70 n11 p2726-32 Jun 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ionosphere, Temperature), (*Magnetic storms, Atmospheric temperature), (*Atmospheric temperature, Magnetic storms), Electrons, Ions, Excitation, Magnetic fields, Aurorae, Electron density, Diurnal variations, Geophysics

Ionospheric F region electron and ion temperatures obtained by the Millstone Hill ionospheric observatory for the month of September, 1963, are discussed. This month was the most magnetically disturbed one in 1963. By chance, observations were made roughly equally on very disturbed and quiet days. A comparison of the daytime temperature behavior indicates that on the disturbed days the electron temperature T sub e is little different from that on the quiet days though the ion temperature at 300 km altitude shows a significant increase (approx 100 K). At night, however, large increases in T sub e and T sub i were found at all heights. T sub e increased by approx 700 K and T sub i by approx 200 K. The source of these nighttime temperature increases is uncertain, but may be local particle precipitation, or heat may be transported from the auroral zones where joule heating would be efficient. (Author)

AD-621 256 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
NATIONAL ENGINEERING SCIENCE CO HOUSTON TEX
THE EFFECTS OF INTERNAL WAVES IN THE EASTERLIES ON MESOSCALE WEATHER DEVELOPMENTS.
Final rept. for 1 Jul 64-30 Jun 65,
by Joseph L. Goldman, and John C. Freeman,Jr..
Jul 65, 93p. Rept. no. SN-192-2
Contract DA28 043AMC00173E Proj. 1V014501B53A09

Unclassified report

Descriptors: (*Atmospheric tides, Tropical regions), (*Marine meteorology, Atmospheric tides), Atmosphere models, Mathematical models, Atmosphere motion, Wind, Climatology, Meteorology

A model based on the general theory of internal waves presented in the Interim Report, and on the analyzed data from the western tropical Pacific is presented. The physical description of parameters results from the analysis of three cases of internal waves propagating along the inversion through the Hardtack network. A test of the theory for a simple case shows general agreement with existing

data in development and propagation. The final numerical development of the theory appended in the report is general and can be used to test a large number of cases simultaneously. Also appended is a climatological study of rainfall over water in the tropics. (Author)

AD-621 314 Div. 2/7 ,2/6 ,2/1
CFSTI Prices: HC $6.00 MF $1.50
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD MASS SPACE PHYSICS LAB
GEOPHYSICS AND SPACE DATA BULLETIN, VOLUME II NUMBER 1,
by Anne L. Carrigan, and Norman J. Oliver. Mar 65, 281p.
Unclassified report

See also AD-615 161.

Descriptors: (*Geophysics, Periodicals), (*Space environmental conditions, Periodicals), Magnetometers, Cosmic rays, Neutrons, Intensity, Monitors, Radar reflections, High frequency, Electromagnetic waves, Propagation, Extraterrestrial radio waves, Atmospheric sounding

Contents: Component and total field intensity magnetometer; Cosmic ray neutron intensity monitor; Oblique backscatter radar; Oblique H-F propagation; Riometer; Solar optical patrol observations; Solar radio emission; and Vertical incidence ionospheric soundings.

AD-621 326 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
PREDICTING THE STATE OF THE UPPER ATMOSPHERE,
by G. F. Schilling. Sep 65, 7p. Rept. no. P-3234
Unclassified report

Prepared for presentation at the Symposium on Weather Forecasting at Vienna (Austria), 23-25 Sep 65.

Descriptors: (*Upper atmosphere, Weather forecasting), (*Weather forecasting, Upper atmosphere), Meteorological parameters, Solar disturbances, Atmospheric sounding, Meteorological instruments, Reviews

Present capabilities for predicting upper atmosphere conditions are reviewed briefly. The principal prediction methods are contrasted with the methods of forecasting employed in tropospheric meteorology. Standard model atmospheres can be considered analogous to synoptic weather maps, but the principal tools of the upper atmosphere forecaster are indices of solar activity, resulting in basic differences of approach. True synoptic analysis of the upper atmosphere above the mesopause is still in the future, but significant progress is being made toward this objective. (Author)

AD-621 367 Div. 2/7 ,2/9
CFSTI Prices: HC $1.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AN EFFECT OF SOLID ROTATION ON DIFFUSION PROCESSES, WITH POSSIBLE APPLICATION TO LARGESCALE TURBULENT TRANSPORTS IN THE ATMOSPHERE AND THE OCEAN.
Technical rept.,
by Pierre Welander. Jun 65, 16p. Rept. no. reference no. 65-25
Contract Nonr219600 Proj. NR083 004
Unclassified report

Descriptors: (*Diffusion, Coriolis effect), (*Coriolis effect, Diffusion), (*Atmosphere, Transport properties), (*Oceans, Transport properties), Fluids, Rotation, Turbulence, Heat transfer, Geophysics

A gas in solid rotation that is subjected to a radial temperature gradient develops a component of heat diffusion at right angles to the gradient. The magnitude of this diffusive flux, relative to the radial component, is 2 lambda omega/nu where lambda and nu are the mean free path and the mean radial speed of the molecules, respectively, and omega is the angular velocity of the system. Corresponding effects occur in diffusion of mass and momentum. It is suggested that the same effect becomes important in the large-scale turbulent transports in the atmosphere and the oceans. The prediction is that a general eastward eddy heat flux should occur. The eastward eddy heat fluxes in the Gulf Stream going up the gradient of temperature can be explained by this mechanism. More observations of the diffusive fluxes in the atmosphere and the oceans are, however, required to test the theory. (Author)

AD-621 368 **See Fld. 20/4**

AD-621 369 **See Fld. 8/10**

AD-621 370 Div. 2/7 ,25/3
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
THE EXPECTED INTENSITY OF A MAGNETIC DIPOLE TRANSITION IN THE IONOSPHERE.
Scientific rept.,
by Jay R. Herman. 1 Sep 65, 78p. Rept. no. SR-237
Contract AF19 628 4014 Grant ,NSF GP2914
Proj. 8605 Task 860502
AFCRL , 65-536
Unclassified report

Descriptors: (*Ionosphere, Plasma physics), (*Plasma physics, Ionosphere), (*Selection rules, Ionosphere), Magnetic moments, Dipole moments, Electron transitions, Oxygen, Electromagnetic waves, Propagation, Magnetohydrodynamics, Thermal radiation, Bremsstrahlung, Geophysics

A prediction is obtained for the strength of a magnetic dipole transition for two components of the ionosphere that possess a permanent magnetic moment. The expressions that are obtained can be used to find the number density of these species once a suitable experiment is designed to measure the actual intensity. The problem is separated into three main parts. First an equation is obtained that describes the transfer of electromagnetic energy in a magneto-ionic medium. The effect of the free electrons is introduced by requiring that the wave number be related to the frequency by a dispersion relation. The dispersion relation, in turn, is associated with the refractive index of the medium. In addition, a velocity for the transfer of energy in the form of photons is obtained that permits the energy density to be associated with the intensity. Second, the various sources of electromagnetic energy that contribute to the total intensity are discussed. These are, the magnetic dipole emission from atomic oxygen or nitric oxide, the thermal emission from the heavy particles (neutrals and ions), the electron bremsstrahlung, and the external cosmic and ground based radio noise. Third, the methods of solution are discussed for the integro-differential equation that determines the total intensity at each point in the medium. These methods are chosen for the ease with which they can be adapted for computer analysis. (Author)

AD-621 374 **See Fld. 3/1**

AD-621 375 Div. 2/7 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
A SUBSONIC D-REGION PROBE-THEORY AND INSTRUMENTATION.
Scientific rept.,
by L. C. Hale, and D. P. Hoult. 31 Aug 65, 48p.
Rept. no. SR-247
Contract DA ARO D31 124G659 ,NsG134 61
Unclassified report

Descriptors: (*Atmospheric sounding, Probes (Electromagnetic)), (*Ionosphere, Probes (Electromagnetic)), (*Telemeter systems, Atmospheric sounding), (*Meteorological instruments, Atmospheric sounding), Ions, Electron density, Measurement, Sounding rockets, Radio equipment

The philosophy, theory, and a description of the instrumentation of a subsonic, D-region ion and electron probe are presented. It is shown theoretically that a blunt, high potential, parachute borne probe collects charged particles according to a simple, angle of attack independent, mobility theory. This theory has been substantiated experimentally with payloads launched on Arcas rockets. The design of these payloads, which include a range-switching electrometer and low-cost telemetry system, is discussed in detail. (Author)

AD-621 376 Div. 2/7 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
A SUBSONIC PROBE FOR THE MEASUREMENT OF D-REGION CHARGED PARTICLE DENSITIES.
Scientific rept.,
by R. G. Willis. 1 Sep 65, 49p. Rept. no. SR-245
Contract DA ARO D31 124G659 ,NsG134 61
Unclassified report

Descriptors: (*Atmospheric sounding, Probes (Electromagnetic)), (*Ionosphere, Probes (Electromagnetic)), (*Telemeter systems, Atmospheric sounding), (*Meteorological instruments, Atmospheric sounding), Ions, Electron density, Measurement, Sounding rockets, Radio equipment

The philosophy, theory, and preliminary results of a program to measure charged particle number densities in the D-region of the ionosphere are presented. The instrument used is a subsonic, parachute-borne, bipolar probe with a planar collector. The probe geometry and electronics, the relevant theory, and the experimental results from recent Arcas rocket shots are reported. Results indicate positive ion densities of the order of 1000/cc from 60 to 70 kilometers. An error analysis of these results shows that the principal error results from an uncertainty in probe potential stemming from solar ultra-violet irradiation of the sides of the probe during daytime shots. This probe system is significant in that the results are independent of angle of attack, and in that the commonly used free-molecular 'ram' theory is replaced a continuum theory more appropriate to the region 40 to 80 kilometers. (Author)

AD-621 418 Div. 2/7
CFSTI Prices: HC $3.00 MF $0.75
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
THE STATISTICAL CHARACTERISTICS OF THE RADAR ECHO AS A FUNCTION OF THE DYNAMIC PROCESSES AND MICROSTRUCTURE OF THE METEOROLOGICAL ENTITY (SVIAZ STATISTICHESKIKH KHARAKTERISTIK RADIOLOKATSIONNOGO SIGNALA S DINAMICHESKIMI PROTSESSAMI I MIKROSTRUKTUROI METEOOB"EKTA).
Russian translation,
by A. G. Gorelik, Iu. V. Melnichuk, and A. A. Chernikov. Aug 65, 94p. Rept. no. T-R-479
Contract AF19 628 3880
TT , 65-63971
Unclassified report

Trans. of Tsentralnaya Aerologicheskaya Observatoriya. Trudy (USSR) n48 p3-54 1963.

Descriptors: (*Meteorological radar, Weather forecasting), (*Radar echo areas, Meteorological parameters), (*Weather forecasting, Meteorological radar), Clouds, Atmospheric precipitation, Radar reflectors, Radar reflection, Atmospheric motion, Statistical analysis

This article treats the development of a statistical

radar method. It contains the entire theory of the method and indicates the possibilities of radar measurement of the wind speed and the micro-characteristics of precipitation. Mathematical formulas are given for using the spectrum of the radar echo to determine the average rate of power dissipation epsilon in turbulent flow, the wind shear, the hydrometeor size distribution, etc. The observational technique and the apparatus are described. Observational data are presented for clouds of various types whose epsilon-values have been calculated. The paper also states the results of wind observations and indicates the feasibility of separating the directional pulsations of the wind from its velocity pulsations. The article contains the results of radar measurement of hydrometeor size distribution, precipitation intensity, etc. The lines of further develpment of statistical radar methods are noted. (Author)

AD-621 419 Div. 2/7 ,8/6
CFSTI Prices: HC $3.00 MF $0.75
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
RADAR STUDIES OF ECHOES FROM A CLEAR SKY (RADIOLOKATSIONNYE ISSLEDOVANIIA OTRAZHENII OT IASNOGO NEBA).
Research translation,
by A. A. Chernikov. Jul 65, 65p. Rept. no. T-R-480
Contract AF19 628 3880
TT , 65-63972

Unclassified report

Trans. of Tsentralnaya Aerologicheskaya Observatoriya. Trudy (USSR) n48 p56-97 1963.

Descriptors: (*Radar echo areas, Meteorological phenomena), (*Meteorological phenomena, Radar echo areas), (*Atmospheric sounding, Radar scanning), (*Meteorological radar, Atmospheric sounding), Atmospheric refraction, Radar reflections, Periodic variations, Atmosphere, Dielectric properties, Electromagnetic waves, Propagation, USSR

General ideas about the seasonal and daily variations of the concentration, intensity, and other characteristics of echoes are formulated on the basis of various radar methods of investigating reflecting objects and information is acquired on the movement, structure, and form of the echo sources. These are used to construct a physical model of the observed phenomena. (Author)

AD-621 422 Div. 2/7
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
THE RELATION OF THE LIQUID-WATER CONTENT AND INTENSITY OF PRECIPITATION TO THE RADAR REFLECTIVITY OF THE METEOROLOGICAL ENTITY WITH VARIOUS PARAMETERS OF THE DROP-SIZE DISTRIBUTION,
by A. G. Gorelik, and G. A. Smirnova. May 65, 13p. Rept. no. T-R-481
Contract AF19 628 3880
TT , 65-63975

Unclassified report

O Svyazi Vodnosti i Intensivnosti Osadkov s Radiolokatsionnoi Otrazhaemostyu Meteoobekta pri Razlichykh Parametrakh Raspredeleniya Kapel po Razmeram. Trans. of Tsentralnaya Aerologicheskaya Observatoriya. Trudy (USSR) n48 p98-105 1963.

Descriptors: (*Atmospheric precipitation, Radar echo areas), (*Radar echo areas, Atmospheric precipitation), (*Meteorological radar, Atmospheric precipitation), Liquids, Water, Raindrops, Particle size, Radar reflections, Correlation techniques, USSR

AD-621 474 **See Fld. 9/5**

AD-621 505 Div. 2/7
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
EXPERIMENTS IN NUMERICAL OBJECTIVE FRONTAL ANALYSIS,
by Robert J. Renard, and Leo C. Clarke. 20 Apr 65, 10p.

Unclassified report

Prepared in cooperation with Navy Fleet Numerical Weather Facility, Monterey, Calif. Pub. in Monthly Weather Review, v93 n9 p547-56 Sep 1965. (Copies not available to DDC or Clearinghouse customers) Presented at the Annual American Meteorological Society Meeting (45th) in New York City, January 27, 1965.

Descriptors: (*Air mass analysis, Numerical analysis), (*Weather forecasting, Air mass analysis), Meteorological parameters, Boundary value problems, Programming (Computers), Naval research

A major area of weather analysis still requiring manual subjective determination is that of locating fronts. The experiments reported on here concern an attempt to incorporate objective frontal analysis into the operational computer routines of the U.S. Navy Fleet Numerical Weather Facility, Monterey, Calif. The synoptically important numerically-derived frontal zone is regarded as a hyperbaroclinic region whose boundaries may be defined as quasi first-order thermal and moisture discontinuities; the boundaries are located through use of suitably defined second derivatives of various potential temperature parameters. Application is made to 850-mb. and surface (or 1000-mb.) frontal analyses on a hemispheric basis. The analyses for 0000 and 1200 gmt January 1, 1965 are selected to exemplify results of the most promising of the experiments. Verification against hand-derived frontal analyses, difficulties with the existing scheme, and proposed modifications to the continuing program are discussed. (Author)

AD-621 565 **See Fld. 18/8**

AD-621 573 Div. 2/7 ,2/3
CFSTI Prices: HC $2.00 MF $0.50
ATMOSPHERIC RESEARCH AND DEVELOPMENT CORP KANSAS CITY MO
TROPOPAUSE PENETRATIONS BY CUMULONIMBUS CLOUDS.
Final rept.,
by Michael J. Long, Howard H. Hanks, and Robert G. Beebe. Jun 65, 34p. Contract AF19 628 2454 Proj. 8624 Task 862401
AFCRL , 65-561

Unclassified report

Descriptors: (*Climatology, Cumulonimbus clouds), (*Cumulonimbus clouds, Tropopause), (*Tropopause, Cumulonimbus clouds), Thunderstorms, Penetration, Height finding, Radar scanning, Meteorological radar, Meteorology

This report presents a summary and analysis of three years of research on penetrations of the tropopause by cumulonimbus clouds. During this time, a four year climatology of penetrations of the tropopause by thunderstorms was constructed for ten locations in the United States. WSR-57 radar data were used to determine the height of the thunderstorms during the 1961 through 1964 period. Tropopuase penetrations of more than 5,000 feet were summarized by geographical areas, months, and on an hourly basis. The number of cloud tops above 60,000 feet and the number of consecutive hours of penetrations at a station were also investigated. Three years of data from USAF radar stations abroad suggest a very small number of penetrations in the tropics and high midlatitudes. Changes in the height and character of the tropopause near penetrations were studied in two serial sounding situations. Also, a method of estimating the maximum height of thunderstorms was proposed and tested with a small data sample. (Author)

AD-621 586 Div. 2/7 ,30/2
CFSTI Prices: HC $4.00 MF $1.00
NATIONAL SEVERE STORMS LAB NORMAN OKLA
PAPERS ON WEATHER RADAR, ATMOSPHERIC TURBULENCE, SFERICS AND DATA PROCESSING.
Technical note,
by Charles G. Clark, William E. Cobb, J. T. Dooley, Kathryn C. Gray, and William E. Herrmann. Aug 65, 144p. Rept. no. NSSL-24
WB,DC , TN-3

Unclassified report

Descriptors: (*Meteorological radar, Reports), (*Atmospheric motion, Reports), (*Atmospherics, Reports), (*Data processing systems, Weather forecasting), Hail, Water, Ice, Thunderstorms, Lightning, Radar echo areas, Weather stations, Meteorology

Contents: Wsr-57 reflectivity measurements and hail observations; Thunderstorm turbulence and radar echoes; 1964 data studies; Circularly polarizable radar and hail detection; Wave length dependence of the radar reflectivity of water and ice spheres; Sferics reception at 500 KC./SEC., radar echoes, and severe weather; Locating and tracking areas of lightning; NSSL radarhydrology program; Computer program for calculating average lengths of weather radar echoes and pattern bandedness; Data processing at NSSL in 1964; Radar data acquisition techniques; and NSSL mesoscale network of surface stations.

5/1. ADMINISTRATION AND MANAGEMENT

AD-620 847 Div. 30/1 ,10/6 ,2/7 ,2/1 ,+
CFSTI Prices: HC $4.00 MF $0.75
AEROSPACE TECHNOLOGY DIV LIBRARY OF CONGRESS WASHINGTON D C
FOREIGN SCIENCE BULLETIN, 1965, VOL. 1, NO. 9.
Sep 65, 104p.
TT , 65-63869

Unclassified report

A monthly review of selected foreign scientific and technical literature sponsored by the Department of Defense. See also AD-619 249.

Descriptors: (*Scientific research, Reviews), USSR, Rocket motors (Solid propellant), Lightning, Solar radiation, Noctilucent clouds, Extraterrestrial radio waves, Space communication systems, Lasers, Hydrofoils, Fog, Energy conversion, Oscillators, Acrylic resins, Upper atmosphere, Thermodynamics, Mechanics, Symposia

Contents: Combustion instability in solid-propellant rockets; Soviet research on ball lightning; New data on the 11-year solar activity cycle; Noctilucent cloud research; Interstellar communications; Giant pulses from a neodymium laser with a photosensitive liquid Q-switch; Soviet hydrofoils; Effects of fog on visible and infrared radiation; The efficiency of converting the kinetic energy of vapor of conducting liquids during condensation in an electromagnetic field; Nuclear spin oscillator; Polymerization of methyl methacrylate in strong electrostatic fields; A new model of the solar activity cycle; All-Union conference on the physics of the upper atmosphere; Fourth scientific conference on evaporation, combustion, and gas dynamics of disperse systems; Work of the seminar on mechanics; Monthly, seasonal, and annual characteristics of the bariccirculation regime in the european natural synoptic region during the period 1900-1964.

AD-620 953 Div. 30/1 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE SCIENCE CORPS,
by Raoul J. Freeman. Aug 65, 7p. Rept. no. P-3217

Unclassified report

Descriptors: (*Scientific research, Research program administration), (*Research program

administration, Scientific research), Scientific personnel

A central government agency is proposed as the most efficient form of organization to (1) provide comprehensive national research strategy and organization, (2) conduct evaluations of scientific proposals, (3) perform technical scientific audits, (4) develop 'sensible' research control procedures, and (5) sponsor 'research on research.'

AD-621 154 **See Fld. 12/1**

AD-621 209 **See Fld. 5/2**

AD-621 253 **See Fld. 5/9**

AD-621 318 **See Fld. 6/3**

AD-621 392 **See Fld. 12/1**

AD-621 512 Div. 30/1 ,15/2 ,26/2 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
A CHANCE-CONSTRAINED MODEL FOR REAL-TIME CONTROL IN RESEARCH AND DEVELOPMENT MANAGEMENT.
Systems research memo.,
by Abraham Charnes, and Andrew C. Stedry.
Jul 65, 18p. Rept. no. SRM-130
Contract Nonr122810 ,DA31 124ARO D322
Proj. NR047 021 ,NR047 048
Unclassified report

Descriptors: (*Management control systems, Research program administration), (*Management planning, Research program administration), (*Research program administration, Management engineering), (*Mathematical programming, Management engineering), Stochastic processes, Decision making, Real time, Data processing systems, Computers, Operations research, Budgets, Optimization

Funding of research projects is considered as encompassing three stages: (1) an initial short run plan for funding based upon projected regular demands and availability subject to random deviations; (2) adjustment of the initial plan to take into account the actual regular demands and availability and the funding of significant break-throughs which occur at random intervals preempting other demands; and (3) a plan for longer-run availability and demands which constitute a 'posture' desired subsequent to the funding adjustments of (2). The essence of the distribution of the unexpected demands is multimodality with low probability of occurrence but high resource demand when they do occur. This approach represents a substantial departure from the usual planning model development which produces only an optimal plan based on forecasted developments without provision for adjustment when the forecasted events actually materialize and additional unexpected demands are placed on resources. The adjustment process explored here--which provides the mechanism for optimal implementation of the original plan or control of resource allocation--enables optimal response to information received in 'real-time' avoiding the frequently observed over- or under- response to receipt of such information without reference to the impact of the interim decision on future capabilities. (Author)

AD-621 557 **See Fld. 11/9**

5/2. DOCUMENTATION AND INFORMATION TECHNOLOGY

AD-621 066 Div. 32/3 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
COMPUTER USAGE CO INC BALTIMORE MD
CONVERSION OF NIH DATA.
1965, 21p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. A copy is available for public sale.

Descriptors: (*Documentation, Distribution), (*Programming (Computers), Documentation), Magnetic tape, Medical research, Biological laboratories, Army, Subject indexing, Information retrieval

The U. S. Army Biological Laboratories' Selective Dissemination of Information Program (SDI) (AD-617 086) uses magnetic tape provided by the National Library of Medicine's MEDLARS program. This publication describes the conversion process from Honeywell format to UNIVAC SS-90-II format. The resulting tape serves as input to the above mentioned SDI program. (Author)

AD-621 067 Div. 32/3 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
COMPUTER USAGE CO INC BALTIMORE MD
SERIAL LIBRARY SYSTEM.
1965, 61p.
Unclassified report

Descriptors: (*Periodicals, Programming (Computers)), (*Libraries, Programming (Computers)), (*Programming (Computers), Periodicals), Records, Army, Biological laboratories, Punched cards, Magnetic tape

A computer program for the UNIVAC SS90-II of the U. S. Army Biological Lab. at Fort Detrick, Frederick, Md. has been developed to process serial records encompassing various functions such as: acquisition, routing, binding, supplier's lists and accumulative holdings.

AD-621 209 Div. 32/3 ,30/2 ,30/1
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
APPLIED MECHANICS REVIEWS, WADEX WORD AND AUTHOR INDEX, VOLUME XVI, 1963,
by E. A. Ripperger, Harold Wooster, Stephen Juhasz, and David Falconer. Sep 65, 639p. Contract AF AFOSR33 64 Proj. 9769 Task 976901
AFOSR , 65-0728
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C., 20402, $3.50 as D301.45/19-2: 65-0728. MF$2.25 available from CFSTI.

Descriptors: (*Mechanics, Indexes), (*Periodicals, Indexes), (*Mechanical engineering, Reviews), Subject indexing, Information retrieval

WADEX (Word Author inDEX) an IBM 1401 prepared mechanical index, extension of KWIC. WADEX usable for browsing and searching. This second WADEX is based on 8,000 titles of APPLIED MECHANICS REVIEWS (AMR), Vol. 16, 1963, an international critical review magazine. In WADEX, titles printed fully with author names, and as many lines used as necessary (60 characters per line). WADEX entry: word in title (except forbidden word) or author's name. Alphabetically sequenced entries printed out of context. Words are single words or hypenated word pairs or 'Tagged Words' (TW). Latter consist of significant 'word compounds' in which one or more words are forbidden words. TW selected from subject index authority list of AMR and hyphenated words from frequency list of words of previous WADEX. For more than one identical word entries, titles alphabetized according to first author and for more than one identical word entries, titles alphabetized according to first author and for more than one identical author entries according to reference number, which printed in line with entry. Each entry followed by block containing year/month/AMR review number. Multiple entries listed only once per column. WADEX arranged in 2 columns, both columns printed simultaneously with dictionary entries at top and pagination at bottom by computer. After addition of 26 alphabetics, 'Compuscript' is the photo-ready copy with 6.5 average entry per paper including 1.5 for authors. (Author)

AD-621 354 **See Fld. 9/4**

AD-621 408 Div. 32/3 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J GRADUATE SCHOOL OF LIBRARY SERVICE
A COMPARATIVE STUDY OF THREE SYSTEMS OF INFORMATION RETRIEVAL: A SUMMARY,
by Norman D. Stevens. 1 Aug 61, 4p. Contract AF49 638 848
AFOSR ,PB 3516, ,164 002 CANCELED
Unclassified report

Pub. in American Documentation p243-6 Oct 1961.

Descriptors: (*Information retrieval, Analysis), Punched cards, Handbooks, Libraries, Subject indexing, Catalogs, Costs, Explosive materials, Time

Three approaches to the problems of information retrieval were examined to determine factors affecting conditions of use. Input costs and cost per usage were much higher for the mechanized approaches than for conventional library techniques. The mechanized system was, for certain types of questions, more efficient than the library reference approach in producing answers. The difference was not great enough to offset the higher basic costs; and a punched card-handbook system of the type examined is not, therefore, recommended. Conditions under which such a system might be feasible, and what such a system should provide if used, are given. The major recommendation, however, points out the need to find ways in which library catalogs can be strengthened to provide a more efficient level of indexing and more ready access to concealed data. (Author)

5/3. ECONOMICS

AD-620 836 Div. 32/4 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
COST SENSITIVITY ANALYSIS,
by A. J. Tenzer. Mar 65, 24p. Rept. no. P-3097
Unclassified report

Descriptors: (*Costs, Analysis), (*Guided missile defense systems, Costs), Economics, Sensitivity, Guided missiles (Underwater-to-surface)

Cost sensitivity analysis is the process of determining how variations in the configuration of a weapon system affect the weapon system resources requirement or costs. The report attempts to show that cost sensitivity analysis can provide a meaningful method for handling uncertainty. It also attempts to show that cost sensitivity analysis can be used to compare alternative weapons configuration and operational plans.

AD-620 921 Div. 32/4 ,15/1
CFSTI Prices: HC $4.00 MF $0.75
PENNSYLVANIA UNIV PHILADELPHIA
INVENTORY CONTROL UNDER STOCHASTIC LEAD TIME AND STOCHASTIC DEMAND.
Master's thesis,
by Kenneth R. Rand,Jr.. 1965, 109p.
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Inventory control, Mathematical models), Stochastic processes, Distribution (Economics), Probability, Decision making, Costs, Stock level control

An attempt is made to investigate the behavior of an inventory system in which lead time, the size of the demand order, and the time between successive demand orders are all random variables with known probability distributions. Since adequate analytical mathematical models are not existant, a computer-based simulation model is used to study the inventory system. An introduction to the inventory problem and a description of inventory systems currently in use are provided. The formulation of the model is described. Results are presented as graphs of stockout time as a function of reorder point.

AD-620 976 **See Fld. 13/9**

AD-620 992 Div. 32/4
CALIFORNIA UNIV LOS ANGELES BUREAU OF BUSINESS AND ECONOMIC RESEARCH
INSTITUTIONS, POLICY, AND MONETARY ANALYSIS,
by Karl Brunner. 1965, 25p. Rept. no. reprint no. 54
Unclassified report

Pub. in The Journal of Political Economy v73 n2 p197-218 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Money, United States), (*Economics, United States Government), Commerce, Analysis, Banking, History

The book by Milton Friedman and Anna Schwartz 'A monetary history of the United States, 1867-1960' (Princeton Univ. Press, 1963) is reviewed. The review is divided as follows: (1) Money-supply theory: base, multiplier, and money stock; reserve ratio and currency ratio; explanation of the base. (2) Velocity theory: breakdown of the permanent-income hypothesis of velocity; search for an explanation; case against 'the case against interest rates'; case for interest rates. (3) Monetary policy.

AD-621 514 **See Fld. 13/6**

5/4. HISTORY, LAW AND POLITICAL SCIENCE

AD-621 322 **See Fld. 15/7**

AD-621 464 **See Fld. 5/11**

AD-621 597 **See Fld. 8/2**

5/6. HUMANITIES

AD-621 392 **See Fld. 12/1**

5/7. LINGUISTICS

AD-621 128 Div. 32/11,32/2
CFSTI Prices: HC $1.00 MF $0.50
LEHIGH UNIV BETHLEHEM PA CENTER FOR THE INFORMATION SCIENCES
COMPUTATIONAL, PHONOLOGICAL AND MORPHOLOGICAL LINGUISTICS AND RETRIEVAL STUDIES. REPORT NO. 1: GRAMMARS AND TEXT ANALYSIS.
Rept. for 16 Sep 64-15 Sep 65,
by Donald J. Hillman. 23 Aug 65, 25p. Contract AF AFOSR724 65 Proj. 9769 Task 976905
Unclassified report

Descriptors: (*Language, Analysis), Information retrieval, Documentation, Processing

The role of grammatical analysis in processing text for document and message retrieval is first explored, and certain requirements formulated. The utility of transformational grammars in text analysis is then discussed by considering whether transformations are a) meaningpreserving, b) truth-preserving and c) informationpreserving. It is argued that such grammars are generally inappropriate for the retrieval purposes mentioned. A concluding section offers criteria for measuring the simplicity of a grammatical model. (Author)

AD-621 159 Div. 32/11,32/2
CFSTI Prices: HC $1.00 MF $0.50
BUNKER-RAMO CORP CANOGA PARK CALIF
SOME COMMENTS ON ALGORITHM AND GRAMMAR IN THE AUTOMATIC PARSING OF NATURAL LANGUAGES,
by Paul L. Garvin. 1965, 10p. Contract AF49 638 1516 Proj. 9769 Task 976905 AFOSR , 65-1386
Unclassified report

Prepared for presentation at 1965 International Conference on Computational Linguistics, 19-21 May 65, New York City.

Descriptors: (*Language, Analysis), (*Machine translation, Language), Programming (Computers), Automatic, Tables

The repeated assertion regarding the efficiency of a simple parsing algorithm combinable with a variety of different grammars written in the form of appropriate tables of rules is examined. The question is raised of the increasing complexity of the tables when more than the most elementary natural-language conditions are included, as well as the question of the ordering of the rules within such nonelementary tables. It is concluded that the structuring of the parsing program as an executive routine with appropriate subroutines is a satisfactory separation of grammar and algorithm. (Author)

AD-621 160 Div. 32/11,32/2
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV LOS ANGELES
MATHEMATICAL MODELS OF SYNONYMY,
by H. P. Edmundson. 1965, 19p. Contract AF AFOSR612 64 Proj. 9769 Task 976905 AFOSR , 65-1387
Unclassified report

Presented at 1965 International Conference on Computational Linguistics, 19-21 May 1965, Park-Sheraton Hotel, New York. Prepared in cooperation with System Development Corp., Santa Monica, Calif.

Descriptors: (*Language, Mathematical models), Vocabulary, Algebra, Algebraic geometry, Algebraic topology, Projective geometry

An historical summary is made of the concepts of synonymy and antonymy. The roles of part-of-speech and context of a word are considered. The concept of a synonym of a word is shown to require the use of a ternary relation rather than that of a binary relation. Synonymy is defined implicitly, rather than explicitly, by three axioms that lead to equivalence relations that partition the set of content words of a language into equivalence classes. Antonymy is defined implicitly by another set of three axioms. Several algebraic, geometrical, and topological models of synonymy and antonymy are posed and examined. (Author)

AD-621 310 Div. 32/11,32/2
CFSTI Prices: HC $6.00 MF $1.25
RAND CORP SANTA MONICA CALIF
PARSE: A SYSTEM FOR AUTOMATIC SYNTACTIC ANALYSIS OF ENGLISH TEXT, PART I,
by Jane Robinson, and Shirley Marks. Sep 65, 204p. Rept. no. RM-4654-PR pt. 1 Contract AF49 638 700
Unclassified report

Descriptors: (*Language, Analysis), Automatic, Programming (Computers), Programming languages, Tables

A description is given of PARSE, a system for the automatic syntactic analysis of English sentences. It is capable of analyzing and labeling the structure of a variety of sentences. The system employs a parsing logic which both applies the grammar exhaustively and disengages it from the routines that apply it to text, so that changes in grammar will not affect the program. The memorandum describes the linguistic features and details the operation of the program. (Author)

AD-621 311 Div. 32/11,32/2
CFSTI Prices: HC $6.00 MF $1.50
RAND CORP SANTA MONICA CALIF
PARSE: A SYSTEM FOR AUTOMATIC SYNTACTIC ANALYSIS OF ENGLISH TEXT, PART II,
by Jane Robinson, and Shirley Marks. Sep 65, 267p. Rept. no. RM-4654-PR pt. 2 Contract AF49 638 700
Unclassified report

Descriptors: (*Language, Analysis), Automatic, Programming (Computers), Programming language, Tables

A list is presented of the three major components of PARSE, a system for the automatic syntactic analysis of English sentences. It contains: (1) a glossary of the words used, grouped alphabetically by families; (2) a presentation of the words organized by the grammar codes devised for them; and (3) a listing of 26 words which, because of their excessive length, would not fit the format and had to be removed from the main body of the glossary. A final section lists errata. (Author)

AD-621 498 **See Fld. 5/11**

5/9. PERSONNEL SELECTION, TRAINING AND EVALUATION

AD-620 839 Div. 23/1 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
A METHOD FOR STRUCTURING TECHNICAL TASKS,
by Joe Silverman. Aug 65, 45p. Rept. no. STB-66-4
Proj. PF016011001
Unclassified report

Descriptors: (*Statistical processes, Job analysis), (*Job analysis, Statistical processes), (*Naval personnel, Selection), Applied psychology

Research is being conducted to develop a method for determining technical skills required for current and future weapons and support systems which will serve as a basis for the Navy enlisted classification structure required in the next decade. This report describes a statistical technique which has been devised to classify work tasks by their level of complexity. Copies of the questionnaires, task lists, and other forms associated with the task classification method are contained in a Technical Supplement (AD-620 840). (Author)

AD-620 840 Div. 23/1
CFSTI Prices: HC $4.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
A METHOD FOR STRUCTURING TECHNICAL TASKS (TECHNICAL SUPPLEMENT),
by Joe Silverman. Aug 65, 116p. Rept. no. STB-66-4A
Proj. PF016011001
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested

by users of DDC. Copy is available for public sale. See also AD-620 839.

Descriptors: (*Naval personnel, Selection), (*Job analysis, Maintenance), Weapon systems, Instruction manuals, Classification, Psychometrics, Operators (Personnel), Machines, Heat exchangers

Research was conducted to develop a method for determining the basic technical skills for current and future weapons and support systems so as to provide the basis for the Navy enlisted personnel classification structure required for the next decade. The engineering department in destroyers was selected for the pilot study. The method being developed in this research involves the analysis of tasks and patterns of tasks in terms of the Technical, Organizational, and Communicational dimensions of the work situation. The acronym SAMOA (Systematic Approach to Multidimensional Occupational Analysis) was adopted as a label for this method. In developing the variables that characterize the Technical dimension, techniques for measuring the 'complexity' and 'variety' of tasks were devised. The report contains the following sections: structure of functions scales, equipment rating form, engineering task lists, task complexity classification list, task comparison forms.

AD-620 841 Div. 23/4 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
REDSTONE ARSENAL HUNTSVILLE ALA
THE RELIABILITY DEMONSTRATOR,
by Robert Lusser. 1965, 4p.
Unclassified report

Descriptors: (*Reliability, Guided missile components), (*Guided missile components, Reliability), (*Training devices, Reliability), Probability, Reliability (Electronics), Automatic

A reliability demonstrator, simulating a complex system, consists of a number of disks that rotate on a common axis. Each disk bears on its circumference a 'bad' spot covering one percent of the circumference, indicating a reliability of 99 percent. This is a means of demonstrating that the overall reliability of a complex automatic system equals the product of the reliabilities of the individual components.

AD-620 950 Div. 23/4
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
M. I. KALININA LENINGRAD POLYTECHNIC INSTITUTE,
by V. S. Smirnov. 24 Aug 65, 26p. Rept. no. FTD-TT-65-411
TT , 65-63904
Unclassified report

Unedited rough draft trans. of mono. Leningradskii Politekhnicheskii Institut im. M. I. Kalinina (USSR) 21p 1962.

Descriptors: (*Education, USSR), (*Universities, USSR), Students, Instructors

AD-620 953 See Fld. 5/1

AD-620 954 Div. 23/4 ,23/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
GETTING STARTED AT SUPERVISORY TRAINING,
by Jerry J. Jensen. Sep 65, 9p. Rept. no. P-3227
Unclassified report

Descriptors: (*Supervisory personnel, Training), Industrial training

The training director is urged to adopt the following considerations in establishing a program for training supervisors. (1) Use as much strategy in the introduction and planning of the program as in its content. (2) Have the supervisory group actively involved in the early stages of program planning. (3) Pretest the training material carefully to assure its acceptance by trainees. (4) Have voluntary attendance at the training sessions. (5) Develop the training on the basis of success, modest beginnings being best. (6) Maintain the top interest of top and middle management by having regular reports emphasizing the relationship between training, problem solving, and profit making.

AD-621 169 Div. 23/4
CFSTI Prices: HC $1.00 MF $0.50
ILLINOIS UNIV URBANA TRAINING RESEARCH LAB
A LISTING OF SOCRATES RESEARCH STUDIES FROM MARCH, 1964, TO JUNE, 1965.
Technical memo.,
by Lawrence M. Stolurow. Sep 65, 8p. Rept. no. TM-19
Contract Nonr398504
Unclassified report

Descriptors: (*Education, Scientific research), (*Learning, Cybernetics), Reviews, Instructors, Computers, Programming (Computers)

AD-621 172 Div. 23/5
CFSTI Prices: HC $3.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
TRAINING UNDERSTANDING OF RELATIVE MOTION: III. GEOGRAPHIC MODEL AND TRADITIONAL INSTRUCTION.
Final rept.,
by Thomas E. Curran, and Daniel N. Braunstein. Aug 65, 70p. Rept. no. STB-66-3
Proj. PF017030202
Unclassified report

Descriptors: (*Naval personnel, Training), (*Naval training, Navigation), Students, Aptitude tests, Performance (Human), Tests, Tables

Two groups of college students were initially trained in relative motion problem solution through demonstration and application of the relationship between motion on geographic and relative plots (conceptual model method). Two other groups of subjects received traditional formula-bound instruction. Aptitude and plotting orientation (own ship vs. guide ship as reference) were also evaluated. No differences were found between the groups in accuracy of solutions achieved on drills involving change of station maneuvering problems administered immediately after initial training. Nine months later, however, those trained by the conceptual model method did better in making inferences concerning the relative motion of two ships from plots of actual geographic positions. Conceptual model training increased the solution speed of students who had high relative motion aptitude and decreased the speed of low aptitude students in comparison to their conventionally trained counterparts. No differences were found attributable to plotting orientation. The next step in this research program will be concerned with improving the conceptual model training method. (Author)

AD-621 173 Div. 23/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
TRAINING UNDERSTANDING OF RELATIVE MOTION: IV. STATUS AND IMPLICATIONS OF CURRENT RESEARCH.
Summary rept.,
by Daniel N. Braunstein. Aug 65, 21p. Rept. no. STB-66-5
Proj. PF017030202
Unclassified report

Descriptors: (*Naval personnel, Training), (*Naval training, Navigation), Students, Tests, Performance (Human), Tables

Results of three experiments in training for solution of maneuvering board problems are reviewed. It is concluded that (a) training in understanding of relative motion is difficult under methods of classroom instruction thus far used; (b) traditional, formula-bound training was inadequate when transfer of training criteria, involving basic understanding of relative motion, were used; (c) a method, emphasizing conceptual model building, inferences, and approximate solutions, shows some promise but needs more development and evaluation. Some needed research is suggested. (Author)

AD-621 253 Div. 23/1 ,30/1
CFSTI Prices: HC $4.00 MF $0.75
STANFORD RESEARCH INST MENLO PARK CALIF
ADAPTATIONS OF SCIENTISTS IN FIVE ORGANIZATIONS: METHODOLOGY AND TECHNICAL APPENDIX.
Technical rept., phase 2b,
by Howard M. Vollmer, Todd R. La Porte, William C. Pedersen, and Phyllis A. Langton. May 64, 118p. Contract AF49 638 1028 Proj. 9778 ,SRI3580 Task 37707
AFOSR , 65-1307
Unclassified report

Descriptors: (*Personnel management, Scientific personnel), (*Scientific personnel, Personnel management), Scientific organizations, Behavior, Sociology, Sampling, Statistical tests, Tables

The investigation is part of a continuing study of the adaptations of scientists in different organizational contexts. The investigation consists of 2 aspects: (1) the effect on the individual of constraints that research organizations impose; and (2) the consequences on the organization produced by individual research on the part of these scientific employees. Five government organizations were studied. Data was collected by interviews and questionnaires. Response data is presented in tabular form and copies of the questionnaire and interview guides are included. In analyzing the data, the dynamics of interaction within each organization were assessed and generalizations were made about the type of organization studied. (Author)

AD-621 318 See Fld. 6/3

AD-621 453 Div. 23/3 ,23/1 ,18/6
CFSTI Prices: HC $3.00 MF $0.75
SOUTHERN METHODIST UNIV DALLAS TEX
THE FINANCIAL ASPECTS OF AN AIR FORCE CAREER.
Master's thesis,
by Ernest Phillip DeBlank. Jun 57, 91p.
Unclassified report

Descriptors: (*Wages, Air force personnel), (*Officer personnel, Wages), Economics, Sociology

The report is restricted to financial matters pertaining to an Air Force officer career. The study covers primarily the current financial situation and proposed changes under consideration at the time of this writing. References to previous Air Force pay and allowances are included only to depict trends, or furnish information which may be of interest to the reader. To permit the reader to follow past, present, and proposed pay legislation, the study traces the results of such legislation on the career of hypothetical Air Force Captain John Doe. (Author)

AD-621 512 See Fld. 5/1

AD-621 540 Div. 23/1 ,28/4
CFSTI Prices: HC $4.00 MF $0.75
NAVAL PERSONNEL RESEARCH ACTIVITY SAN DIEGO CALIF
SCHOOL VALIDATION OF THE BASIC TEST BATTERY AND OF OTHER CLASSIFICATION TESTS (1962-1963),
by Patricia J. Thomas, and Edmund D. Thomas.

ug 65, 115p. Rept. no. STB-66-8
Proj. PF016050102

Unclassified report

Descriptors: (*Naval personnel, Selection), (*Psychometrics, Effectiveness), Achievement tests, Aptitude tests, Performance tests, Recruiting, Correlation techniques, Classification

The Basic Test Battery (BTB) is used in the selection and classification of enlisted men for Class 'A' schools. The report presents the results of the validation of Form 6 of the BTB as a predictor of final school grade in 91 Class 'A' schools. In addition to the four BTB subtests, the Electronics technician Selection Test, Radio Code Test, and Sonar Pitch Memory Test, were included in the analyses. Each sample was validated independently using graduated and academically disenrolled students attending school during the 1962-1963 period. All analyses were of a correlational nature zero-order, multiple regression, and linear sum) and results were reported with and without correction for restriction in range. The most noteworthy finding was the increase in prediction when all of the BTB tests were used in the regression equation, rather than following the traditional practice of using cutting scores on one or more subtests in the battery. The former method has largely been ignored in the area of recruit classification because of prohibitive time-costs. (Author)

5/10. PSYCHOLOGY (INDIVIDUAL AND GROUP BEHAVIOR)

AD-620 904 Div. 28/1
CFSTI Prices: HC $3.00 MF $0.75
ILLINOIS UNIV URBANA TRAINING RESEARCH LAB
VALIDITY JUDGMENTS OF SYLLOGISMS IN RELATION TO TWO SETS OF INDIVIDUAL TERMS.
Technical rept.
by Lawrence Thomas Frase. Sep 65, 82p. Rept. no. TR-10
Contract Nonr398504 Proj. NR154 239

Unclassified report

Descriptors: (*Reasoning, Verbal behavior), Vocabulary, Word association, Correlation techniques, Training

The syllogism was used as a vehicle to study the effects of formal logical quantifiers and affective verbal stimuli upon errors, time, and sureness ratings of validity judgments. Individual words were first rated by 70 subjects on Semantic Differential evaluative scales to obtain their affective values; they were then combined in syllogisms to yield three levels of response incompatibility. Subjects also rated words on belief scales and, in a later session, the syllogistic conclusions containing incompatible or compatible word combiinations were rated on both belief and evaluative scales. The group which received relevant training showed relatively more improvement in their validity judgments of syllogisms with particular conclusions even though both groups had been told the usage of the formal logical quantifiers. Results indicated that two kinds of responses occurred during reasoning; responses controlled by formal structural terms and responses controlled by affective terms. The former were relatively sensitive to training and exhibited gross changes. The latter were little influenced by training and exhibited moderate but table response characteristics.

AD-620 994 Div. 28/1
CFSTI Prices: HC 1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A PERSON WHO READS MINDS.
9 Jun 65, 5p. Rept. no. FTD-TT-65-155
TT, 65-63919

Unclassified report

Unedited rough draft trans. from Kommunist, Erevan (USSR) 23 Nov p2 1963.

Descriptors: (*Parapsychology, Personnel), Reasoning, Perception (Psychology), USSR

AD-621 068 Div. 28/3
CFSTI Prices: HC $2.00 MF $0.50
ROME AIR DEVELOPMENT CENTER GRIFFISS AFB N Y
COLOR SPECIFICATION FOR ADDITIVE COLOR GROUP DISPLAYS.
Technical rept.,
by Edward F. Rizy. Aug 65, 36p. Rept. no. RADC-TR-65-278
Proj. 5597 Task 559705

Unclassified report

Descriptors: (*Colors, Display systems), (*Display systems, Human engineering), Additives, Performance (Human), Specifications, Optical filters, Still projectors

Nine pairs of dichroic filters were used in a xenon-source additive color projector to determine their effects upon observer performance in a search-and-discrimination task with seven color codes. The objective was to define performance parameters preliminary to setting filter specifications. Results indicated that a blue filter, reflecting wavelengths well into the green region, facilitated performance in the majority of color codes. A red filter, close to the infrared in reflectance, reduced performance in most codes. The most efficient color code, regardless of filter, was red. Green, blue and cyan were least efficient. Recommendations were made suggesting a blue filter of approximately 516 millimicrons cutoff and a red filter with a cutoff between 581 and 595 millimicrons, for optimum observer performance in the context of a sevencolor code. Performance criteria were compared and an alternate filter option was described. Further examination of the areas around the most adequate cutoff points and alternate filter arrangements were proposed as the next step toward setting firm specifications. (Author)

AD-621 081 Div. 28/1 ,16/12
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
EFFECTS OF EARLY EXPERIENCE ON BEHAVIOR: EXPERIMENTAL AND CONCEPTUAL CONSIDERATIONS,
by Ronald Melzack. 1964, 29p. Contract NIH MH04235 03

Unclassified report

Pub. in Psychopathology of Perception, p271-99 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Behavior, Sensory deprivation), (*Sensory deprivation, Behavior), (*Sensory perception, Central nervous system), Brain, Cerebral cortex, Conditioned reflex, Adaptation (Physiology), Reaction (Psychology), Pathology, Genetics, Pain, Inhibition, Psychophysiology, Dogs

Contents: Behavior of Scotties raised in a restricted sensory environment; Mechanisms underlying the effects of restriction; Experiments with Beagles raised in restriction cages; Behavioral studies of Beagles; Physiological studies; Implications of the conceptual approach; Genetic contributions; Comparison of effects of restriction and brain lesions; Nature of the effects of sensory restriction.

AD-621 083 **See Fld. 6/16**

AD-621 106 Div. 28/3 ,28/4
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
DETECTABILITY MEASURES IN VIGILANCE: COMMENT ON A PAPER BY WIENER, POOCK, AND STEELE.
Technical note,
by M. M. Taylor. 20 Apr 65, 5p. Rept. no. TN-595

Unclassified report

Pub. in Perceptual and Motor Skills, v20 p1217-21 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Attention, Decision theory), (*Perception (Psychology), Signals), Detection, Performance (Human), Probability, Psychometrics, Canada

Results of a study of time sharing and vigilance reported by Wiener, et al. (1964) have been reanalysed from the viewpoint of signal detection theory. The reported decline in probability of detecting a signal is shown to be due entirely to a progressive change in the observers' response criteria and not to a change in the detectability of the signal. In contrast to the original report that time sharing had a non-significant effect on the probability of detecting a signal, the effect on the detectability of the signal is large. The importance of considering detectability rather than detection measures in vigilance studies is stressed. (Author)

AD-621 135 Div. 28/5 ,28/1 ,28/3 ,16/12
BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D C
THE QUEST FOR SELF-CONTROL, CLASSICAL PHILOSOPHIES AND SCIENTIFIC RESEARCH,
by Samuel Z. Klausner. 1965, 404p. Contract AF49 638 992
AFOSR, 65-0719

Unclassified report

Available from The Free Press, 60 Fifth Avenue, New York, N. Y. 10011.

Descriptors: (*Stress (Psychology), History), (*Adjustment (Psychology), Scientific research), Europe, Greece, Psychology, Religion, Emotions, Behavior, Animals, Psychiatry, Sociology, Social psychology, Mammals

Revised drafts are given of papers presented at a Conference on Self-Control under Stressful Conditions, held in Washington, D. C., on Sept 10-12, 1962. Titles of the papers are as follows. PART ONE on Self-control in the perceptive of history: Collocation of concepts of self-control, Self-images and systems of spiritual direction in the history of European civilization, Self-control: the Greek paradigm. PART TWO on Self-control in a sociological perspective: Popular psychology: a content analysis of contemporary inspirational nonreligious books, Social identity and self-control, The routinization of love: Structure and process in primary relations. PART THREE on Self-control in psychological perspective: Psychodynamic aspects of stress tolerance, Some psychological determinants of stress behavior, Experimental analysis of stress and individual self-control in animal behavior. PART FOUR on Self-control in psychiatric perspective: Psychological factors maximizing resistance to stress, with special reference to hypnosis, Behavioral approach to the problem of self-control, Stress and the concept of selfrealization. PART FIVE on Scientific hermeneutics.

AD-621 143 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
HUNTER COLL OF THE CITY UNIV OF NEW YORK
THE INFLUENCE ON COMMUNICATION EFFECTIVENESS OF EXPLICITLY URGING ACTION AND POLICY CONSEQUENCES.
Technical rept.,
by Walter Weiss, and Sandra Steenbock. Aug 65, 25p. Rept. no. TR-3
Contract Nonr430900 Proj. NR177 271

Unclassified report

Descriptors: (*Attitudes, Social communication), (*Social communication, Attitudes), Performance (Human), Decision making, Social psychology, Group dynamics

Will the explicit recommendation of action and policy consequences that people might find undesirable produce a less favorable change in their evaluation of an attitude object to which these con-

sequences are attached and less willingness to accept the consequences than if no mention is made of them. 144 subjects were exposed to a communication on the usefulness of a course in the history of science, or to a communication which had an additional final paragraph containing explicitly stated consequences, or to no communication at all. The results indicated that, among the initially unfavorable subjects, those exposed to the explicit version exhibited greater favorableness toward the idea of such a course than did the other subjects. Acceptance of the explicitly stated consequences was not differentially affected by the communications. But subjects given the non-explicit communication were less likely than the others to reject the possibility of registering for such a course, an action not explicitly mentioned in either version. (Author)

AD-621 144 Div. 28/5
CFSTI Prices: HC $1.00 MF $0.50
HUNTER COLL OF THE CITY UNIV OF NEW YORK
THE EFFECTS OF KNOWLEDGE OF SOURCE BEFORE VS. AFTER EXPOSURE TO A COMMUNICATION.
Technical rept.,
by Walter Weiss, and Henry Solomon. Sep 65, 16p. Rept. no. TR-4
Contract Nonr430900 Proj. NR177 271
Unclassified report

Descriptors: (*Attitudes, Social communication), (*Social communication, Attitudes), Performance (Human), Decision making, Social psychology

The major purpose was to determine the attitude change effectiveness of identifying the source of a communication before vs after exposure to the communication. 130 college students read the same persuasive communication under four experimental conditions: higher or lower prestige source identified before or after exposure to the communication. They also expressed their willingness to convince a friend and to distribute literature in support of the communicator's point of view. In respect to attitude on the issue, there were no interactions between placement of the source and the nature of the source. The initially unfavorable subjects were differentially affected by the sources when identified after the communication not before. This result suggests that an initially unfavorable attitude on an issue can be modified by regard for the source without the mediation of a cognitive process that operates during the exposure to the communication. Regardless of whether the sources were made known before or after exposure to the communication, the higher prestige source induced greater willingness among the initially unfavorable subjects to perform actions supporting the source's viewpoint than did the lower prestige source. Source did not effect those initially favorable. (Author)

AD-621 166 Div. 16/12
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF
STABILITY IN PSYCHOSIS ADMISSION RATES, THREE DECADES OF NAVY EXPERIENCE,
by Ransom J. Arthur. 1965, 3p.
Unclassified report

Pub. in Public Health Reports v80 n6 p512-4 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Psychoses, Naval personnel), (*Naval personnel, Psychoses), Mental disorders, Neuroses, Diagnosis, Miiitary medicine, Psychiatry

In the peacetime Navy, an institution of young men with a relatively low annual turnover, the admission rate for psychosis will remain steady at approximately 1 admission per 1,000 men per annum. In a wartime situation where the organization is overwhelmed with a fresh population at risk, but also consisting of young men, the rate may be expected to increase by an amount made significant by the very large numbers of persons involved. For example, a rise in the rate from 1 to 1.5 per 1,000 per year in a 3million-man force means an additional 1,500 cases to be treated. For those charged with the responsibility of providing psychiatric services for the Armed Forces, these figures should serve for planning purposes, both in peacetime and in the event of a rapid mobilization. Finally, the naval data should be of interest to those involved with other institutions of young people, such as colleges, where psychosis continues to be a medical problem. (Author)

AD-621 171 Div. 28/1
MASSACHUSETTS UNIV AMHERST
PAIRED-ASSOCIATES LEARNING WITH VARYING RELATIVE PERCENTAGES OF OCCURRENCE OF ALTERNATIVE RESPONSE MEMBERS: INFLUENCE OF INSTRUCTIONS,
by Albert E. Goss. 6 Apr 64, 6p. Contract Nonr269100
Unclassified report

Pub. in Journal of Experimental Psychology, v70 n1 p51-6 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Word association), (*Word association, Psychometrics), Instructors, Correlation techniques

Acquisition and performance with divergent PA units were determined for 4 relative percentages of occurrence of alternative response members (RP) combined with 4 list conditions under matching, regular, and maximizing instructions. Under all 3 instructions and irrespective of RP, percentages of anticipations and actual occurrences of more frequent response members were essentially the same for a single unit presented at constant, short, and at variable, long interunit intervals. With RP of 70-30, 80-20, and 90-10, for a single unit presented with randomly paired intervening stimuli and for 4 units, matching instructions reduced differences between anticipations and actual occurrences. Maximizing instructions increased those differences but did not occasion 100% anticipation. (Author)

AD-621 184 Div. 28/3
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
DECISION INTERVAL AND SIGNAL DETECTABILITY IN A VIGILANCE TASK.
Research paper,
by Jane F. Mackworth. 18 Sep 64, 7p. Rept. no. RP-567
Unclassified report

Pub. in Canad. J. Psychol./Rev. Canad. Psychol. v19 n2 ,p111-7 1965 (Copies available only to DDC users).

Descriptors: (*Attention, Decision making), (*Decision making, Detection), Signals, Perception (Psychology), Reaction (Psychology), Performance (Human), Canada

The paper discusses the effect of the assumed decision interval on the measurement of d'. Previous experiments have revealed a decrement in the detectability (d') of signals during a particular vigilance task involving the detection of a brief pause in the movement of a clock hand. In order to measure the false alarm probability, Ss were required to make a decision once every five sec. as to whether or not there had been a signal in the previous five sec. In this paper Ss were required to respond as soon as they saw a signal, and it was assumed that the decision interval was the signal duration. The thirty-fold change in assumed decision interval produced very little change in the decrement in d' during the run. It is therfore concluded that the length of the assumed decision interval was not a critical factor in determining changes in d' during the continuous clock task. (Author)

AD-621 185 See Fld. 6/15

AD-621 186 Div. 28/5
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF
THE RELATIONSHIP BETWEEN AN INDIVIDUAL'S SOCIOMETRIC STATUS IN DIFFERENT GROUPS OVER A TWO-YEAR PERIOD,
by Paul D. Nelson, and Newell H. Berry. 7 Apr 65, 8p. Proj. MR005 12 2201
NMNRU , 65-5
Unclassified report

Pub. in The Journal of Psychology v60 p31-7 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sociometrics, Military personnel), (*Military personnel, Sociometrics), Marine Corps, Military training, Behavior, Attitudes, Performance (Human), Personality, Social psychology, Correlation techniques

Sociometric status on items of 'best Marine' and 'likability' was obtained from training platoon peers on 101 enlisted Marine recruits during the second and tenth weeks of basic training. Two years later the same Ss were evaluated by different peers in different platoons on sociometric items having to do with garrison work, liberty associates, and a hypothetical combat situation. Second week basic training evaluations were as valid a predictor of two year sociometric status as were tenth week evaluations, with the former being particularly relevant in predicting negative forms of behavior at two years. (Author)

AD-621 187 Div. 28/3
TUFTS UNIV MEDFORD MASS
EFFECTS ON HAND-EYE COORDINATION OF TWO DIFFERENT ARM MOTIONS DURING COMPENSATION FOR DISPLACED VISION,
by Sanford J. Freedman, Sarah B. Hall, and Jerold H.Rekosh. 1965, 6p. Contract AF49 638 1282
Proj. 9778 Task 977801
AFOSR , 65-1365
Unclassified report

Pub. in Perceptual and Motor Skills v20 p1054-6 1965 (Copies not available to DDC or Clearinghouse customers). Research performed in cooperation with Radcliffe College and Brandeis Univ.

Descriptors: (*Vision, Motor reactions), (*Motor reactions, Vision), Motion, Hands, Arms, Eye, Adaptation (Physiology), Perception (Psychology), Proprioception, Psychomotor tests

Comparisons were made between the compensations produced by sagittal arm motion, a swift extension of the arm from its resting position in the lap to an approximately straight ahead position, and by transverse arm motion, the fully extended arm starting from a position at 45 degrees to the body midline at shoulder height and moving parallel to the surface of the table until approximately straight ahead. Eight right-handed male college students were tested with both types of arm motion, 4 wearing base right prisms and 4 wearing base left. Effects of exposure with sagittal motion generalize more to transverse than vice versa. The differences may be related to the greater precision of body midline judgments with sagittal motion. (Author)

AD-621 190 Div. 28/3
PRINCETON UNIV N J
VISUAL VELOCITY DISCRIMINATION: EFFECTS OF BLANKING THE STIMULUS,
by Frank J. Mandriota. 1965, 4p. Contract AF49 638 381 Proj. 9778 Task 977801
AFOSR , 65-1306
Unclassified report

Pub. in Psychon Sci v2 p159-60 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Visual perception, Velocity), Vision, Motion, Visual signals, Thresholds (Physiology)

Weber ratios were obtained for visual velocity discrimination under 2 stimulus conditions which differed only with regard to the presence of visible continuous motion. Discrimination of velocity under normal conditions was compared with discrimination under 'blanked' conditions. In the latter, the subjects saw only the initial and final positions of a target separated in time by intervals comparable to the duration of the motions seen under the former condition. Difference thresholds for blanked motion are approximately double those for continuous motion over a wide range of velocities. (Author)

AD-621 192 Div. 28/5
CFSTI Prices: HC $7.00 MF $1.50
OHIO STATE UNIV COLUMBUS
LABORATORY SIMULATION OF A POLICE COMMUNICATION SYSTEM UNDER STRESS.
Doctoral thesis,
by Thomas Edward Drabek. 1965, 329p. Contract AF AFOSR572 65 Proj. 9779 Task 977901
AFOSR , 65-1714

Unclassified report

Descriptors: (*Police, Communication systems), (*Communication systems, Stress (Psychology)), Simulation, Group dynamics, Performance (Human), Decision making, Social psychology

A laboratory simulate of the communication system of a metropolitan police organization was constructed to (1) analyze organizational stress, (2) explore the utility of realistic simulation as a technique for the analysis of complex organizations, and (3) test selected aspects of the theoretical framework by subjecting the constructed simulate to stress. The simulate involved 4 police officers and 26 simulators. It was found that the simulate behaved exactly as its real counterpart. The central hypothesis of the framework was supported, i.e., if there is organizational stress, then there will be change in organizational performance structure. (Author)

AD-621 280 See Fld. 6/3

AD-621 327 Div. 28/5 ,2/5
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF
PSYCHOLOGICAL ASPECTS OF ANTARCTIC LIVING,
by Paul D. Nelson. 1965, 5p.

Unclassified report

Pub. in Military Medicine v130 n5 p485-9 5 May 1965 (Copies not available to DDC or Clearinghouse customers). Delivered at the Annual Meeting of the Association of Military Surgeons of the U. S. (71st), Washington, D. C. 20-22 Oct 64.

Descriptors: (*Polar regions, Ecology), (*Adjustment (Psychology), Polar regions), (*Naval personnel, Adjustment (Psychology)), Leadership, Social psychology, Emotions, Performance (Engineering), Acclimatization, Stress (Psychology)

AD-621 331 Div. 28/1
DECISION SCIENCES LAB BEDFORD MASS
ADAMS' BISENSORY DISCRETE TRACKING TASK AND THE PSYCHOLOGICAL REFRACTORY PERIOD: A COMMENT,
by Raymond S. Nickerson. 1965, 2p. Proj. 7682

ESD , TR-65-224

Unclassified report

Pub. in Psychon. Sci. v3 p87-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Motor reactions, Decision making), (*Decision making, Tracking), (*Tracking, Motor reactions), Visual signals, Auditory signals, Perception (Psychology), Reaction (Psychology), Reflexes, Attention, Performance (Human)

Adams (1962) has reported an experiment designed to test the 'single channel' interpretation of the 'psychological refractory period' (PRP). The purpose of this note is to challenge the validity of the test and to argue that the results of the experiment are compatible with a 'single channel' hypothesis. (Author)

AD-621 379 Div. 28/2 ,12/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
COMPUTER CONCEPTS INC SILVER SPRING MD
THE ROLE OF HUMAN FACTORS TASK DATA IN AEROSPACE SYSTEM DESIGN AND DEVELOPMENT.
Final rept. for 15 Jun 64-15 Feb 65,
by L. Duncan Hannah, John A. Boldovici, James W.Altman, and Raymond C. Manion. Aug 65, 98p. Contract AF33 615 1557 Proj. 1710 Task 171006
AMRL , TR-65-131

Unclassified report

Subcontracted to American Inst. for Research, Pittsburgh, Pa.

Descriptors: (*Data processing systems, Human engineering), (*Human engineering, Weapon systems), (*Space flight, Systems engineering), (*Air Force, Systems engineering), Management engineering, Personnel management, Decision making, Automation, Information retrieval, Supervisory personnel, Computers, Data storage systems, Performance (Human), Ground support equipment

On the basis of information gathered from generators and users of human factors task data by both interviews and questionnaires and by a review of relevant literature, human factors personnel and data were identified, the relations between them described, and recommendations for an automated human factors task data handling system proposed. Human factors personnel were closely divisible into four hierarchically arranged groups: Program Level Managers, Personnel Subsystem Managers, Department Heads, and Nonmanagerial Personnel. In general, and for the populations described, managers or supervisors were the principal users and nonmanagerial personnel the principal generators of human factors data. A framework that permits classification of both formatted and unformatted data was proposed as responsive to the generally felt need by data generators and users for more orderly 'bookkeeping' in the human factors realm. Desirable characteristics of an automated human factors task data handling system were derived from the questionnaire responses. The responses also indicated that: (1) about 80% thought some use could be made of computers in their work, (2) retrieval time was important to at least 80%, (3) current modal data retrieval times range from 1 to 6 days. (Author)

AD-621 386 See Fld. 6/16

AD-621 400 Div. 28/1
MASSACHUSETTS MENTAL HEALTH CENTER BOSTON
PSYCHOLOGICAL FACTORS MAXIMIZING RESISTANCE TO STRESS: WITH SPECIAL REFERENCE TO HYPNOSIS,
by Martin T. Orne. 1965, 24p. Contract AF49 638 728 Proj. 9779 Task 977901
AFOSR , 65-1161

Unclassified report

The Quest for Self-Control, Free Press, New York, N. Y., Klausner, SZ ED. p286-328 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stress (Psychology), Adjustment (Psychology)), Anesthesia, Mental disorders, Motivation, Attitudes, Pain, Anxiety, Tolerances (Physiology), Behavior

Hypnosis and other psychological factors are considered which maximize an individual's resistance to stress. A survey of hypnosis is presented reviewing present knowledge on hypnotically induced anaesthesia, physical capacity under hypnosis, hypnotically induced amnesia, hypnotizability, and posthypnotic suggestion. It is pointed out that hypnosis has its major effect in providing an increase in motivation. A number of other psychological factors which contribute to an individual's ability to tolerate stress are also instrumental in increasing motivation, in much the same way as the hypnotic situation. The entire question of which factors contribute more to the individual's ability to tolerate stress requires empirical clarification. (Author)

AD-621 432 Div. 28/3
CFSTI Prices: HC $1.00 MF $0.50
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
THE EQUIDISTANCE TENDENCY AND ITS CONSEQUENCES. PROBLEMS IN DEPTH PERCEPTION,
by Walter C. Gogel. Apr 65, 15p.
AM , 65-11

Unclassified report

Descriptors: (*Vision, Space perception), (*Space perception, Vision), Visual perception, Afterimages, Geometric forms, Perception (Psychology)

The equidistance tendency is the tendency for objects or other inhomogeneities in the field-of-view to appear at the same distance as each other with the strength of this tendency being inversely related to directional separation. The evidence for the existence of the equidistance tendency and for its ability to modify the perceived depth resulting from size or stereoscopic cues is reviewed. The equidistance tendency is discussed as a disturbing factor in visual experimentation and as a necessary factor in the understanding of Emmert's law, the moon illusion, and similar phenomena. Several possible explanations for the equidistance tendency are evaluated in terms of the range of phenomena with which it is identified. (Author)

AD-621 436 Div. 16/12,16/11,15/2
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV MINNEAPOLIS DEPT OF STATISTICS
AN APPLICATION OF MULTIVARIATE ANALYSIS TO SOME TRANQUILIZER COMPARISON EXPERIMENTS.
Technical rept.,
by Constance van Eeden, Gordon T. Heistad, and Charles H. Kraft. Nov 63, 14p. Rept. no. TR-32
Contract Nonr71031 Grant ,N1H 2G43C7+8 Proj. NR042 003

Unclassified report

Descriptors: (*Statistical analysis, Psychiatry), (*Tranquilizers, Effectiveness), Experimental data, Factor analysis, Analysis of variance

AD-621 437 See Fld. 6/16

AD-621 478 Div. 28/3 ,16/15
CFSTI Prices: HC $1.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS
SOME EFFECTS UPON VOICE OF HEARING TONES OF VARYING INTENSITY AND FREQUENCY WHILE READING.
Joint project rept. no. 1,
by John W. Black. 25 Jan 50, 9p. Contract N6onr22525 Proj. NR142 993 ,NM001 064 01 01

Unclassified report

Descriptors: (*Speech, Hearing), (*Auditory signals, Verbal behavior), (*Reading, Background), Noise, Intensity, Frequency, Reaction (Psychology), Analysis of variance, Auditory perception

The data for the study gave no indication that vocal pitch (frequency of the fundamental) was affected by the frequency of a stimulus tone that sounded in a speaker's ear during reading. Clearly, however, both the intensity and pitch of voice were affected by the level of the tone that was heard. These effects, however, appeared not to be a function of the intensity of the tone but rather of its loudness. Moreover, they were differential. As the tones were increased from loudness level 10 to 65 through 11 points of measurement vocal intensity and frequency increased linearly. Responses to tones of higher loudness levels were not in keeping with these patterns. Both vocal pitch and intensity increased with greater rate per unit change of the loudness level of the stimulus tone at higher levels, and the acceleration rate was greater for vocal intensity than for frequency. The possibility is suggested that in the production of vocal intensity there is more 'control' in the lower portion of the continuum from soft to loud than in the upper part of this range. (Author)

AD-621 500 See Fld. 6/16

AD-621 540 See Fld. 5/9

AD-621 560 Div. 28/1
MONTANA STATE UNIV MISSOULA
EFFECTS OF A MNEMONIC TECHNIQUE APPLIED TO VERBAL LEARNING AND MEMORY,
by Richard K. Smith, and Clyde E. Noble. 1965, 12p. Contract Nonr296001

Unclassified report

Pub. in Perceptual and Motor Skills v21 p123-34 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Learning, Verbal behavior), (*Memory, Training), Transfer of training, Recall, Retention, Effectiveness, Students

The investigation evaluated the effects of Furst's mnemonic technique applied to serial verbal learning using consonant-vowel-consonant (CVC) lists of Low (1.07), Medium (2.75), and High (4.37) scaled meaningfulness (m') values. Furst's method produced significant differences in Recall (loss over the 24-hr. test) and Relearning, but the differences failed to reach statistical significance for the Learning phase. A complex relationship existed between the effectiveness of the Method and Meaningfulness, with no differences occurring for highly meaningful lists, large differences for medium m' lists, and small differences for low m' lists. Superiority of the experimental groups over the control groups was meainly attributable to better performance on the part of low-ability Ss. Both Meaningfulness and Ability were primary sources of between-group differences during Learning, Recall, and Relearning. Complex interactions appeared between degree of meaningfulness, level of ability, and Furst's method. Some methodological problems were discussed. It was concluded that Furst's mnemonic technique has limited usefulness during the acquisition of a serial verbal list, and perhaps a significant facilitating effect on retention, provided the material to be recalled is of medium or low meaningfulness, but no efficacy for remembering highly meaningful materials learned under the present conditions. (Author)

AD-621 592 Div. 28/1
DECISION SCIENCES LAB BEDFORD MASS
SHORT-TERM MEMORY FOR COMPLEX MEANINGFUL VISUAL CONFIGURATIONS: A DEMONSTRATION OF CAPACITY,
by Raymond S. Nickerson. 10 Oct 64, 6p. Proj. 7682
ESD, TDR-64-558

Unclassified report

Pub. in Canadian Journal of Psychology v19 n2 p155-60 1965 (Copies available only to DDC users).

Descriptors: (*Memory, Photographs), (*Vision, Memory), Visual perception, Performance tests, Configuration

The experiment concerned an aspect of short-term memory somewhat neglected in the past, namely, the ability to remember, i.e., to recognize, complex meaningful visual configurations. S's task was to inspect an extended sequence of photographs of assorted content and to identify those which were occurring for the second time within the sequence. The probability of recognizing the recurrence of a photo as such was very high even with as many as 200 items intervening between its first and second occurrence. (Author)

AD-621 599 See Fld. 6/16

5/11. SOCIOLOGY

AD-620 932 Div. 32/2
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
COMPLEMENTATION IN RUSSIAN: THEORY AND APPLICATION,
by Andrew S. Kozak. Sep 65, 49p. Rept. no. RM-4582-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Language, USSR), Scientific research, Analysis, Information retrieval, Computers, Machine translation

The concept of complementation in Russian is presented both from the Soviet and RAND points of view. An expansion and modification of the Russian view becomes an hypothesis, given in the form of complementation models. The models serve as a basis for the functional annotation of complements in Russian scientific text within the framework of dependency theory. Structured text in computer form is expected to provide the means to check the hypothesis and to establish refined syntactic categories. (Author)

AD-621 128 See Fld. 5/7

AD-621 159 See Fld. 5/7

AD-621 160 See Fld. 5/7

AD-621 310 See Fld. 5/7

AD-621 311 See Fld. 5/7

AD-621 325 See Fld. 22

AD-621 464 Div. 32/9, 32/8
CHICAGO UNIV ILL
NATIONAL INTEGRATION AND POLITICAL DEVELOPMENT,
by Leonard Binder. 1964, 17p. Rept. no. 12
Contract AF AFOSR582 64 Proj. 9779 Task 977902
AFOSR, 65-1162

Unclassified report

Pub. in The American Political Science Review v58 n3 p622-31 Sep 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sociology, Political science), (*Political science, Sociology), (*Culture, Political science), Government (Foreign), Population, Attitudes

The relationship between national integration and political development is explored. The two concepts are held to be situationally bound phenomena, and understanding is sought by exploring their different aspects to form a model rather than by searching for concrete definitions of the two. National integration and an effective bureaucracy are considered to be strongly interdependent. The political relationship between the modernizing elite and the traditional mass is thought to be the key issue in national integration. Given special attention are Mosca's ideas of social type and political formula. (Gaetano Mosca. 'The Ruling Class.' New York, 1958, originally published 1896). In the model constructed, stable political forms will be shaped by the integrative process, if at all. (Author)

AD-621 498 Div. 32/2, 32/11
MITRE CORP BEDFORD MASS
A NOTE ON ASYMMETRY IN PHRASE STRUCTURE GRAMMARS,
by G. H. Matthews. 4 Feb 64, 6p. Contract AF19 628 2390
ESD, TDR-63-471

Unclassified report

Pub. in Information and Control, v7 p360-5 1964 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge, Grants NSF G16526, NIH, MH04737 03, NsG496.

Descriptors: (*Language, Analysis)

In Matthews (1963) Discontinuity and asymmetry in phase structure grammars, several classes of grammars are defined and their generative power determined. These grammars are defined partially by the form of their rules and partially by the form of the derivations of the sentences they generate. That paper shows that one-way grammars and one-way discontinuous grammars are equivalent to context-free grammars as defined by Chomsky (1959). This paper shows that the restrictions on the form of the rules are not essential; any unrestricted rewriting system generates a context-free language if its derivations are confined to one-way derivations as defined in Matthews (1963). (Author)

6/1. BIOCHEMISTRY

AD-620 885 Div. 16/3, 29/2
CFSTI Prices: HC $1.00 MF $0.50
BJORKSTEN RESEARCH FOUNDATION MADISON WIS
STUDY OF FAT OXIDATION PRODUCTS WITH OTHER FOOD COMPONENTS, ANTIOXIDANTS AND TRAPPING AGENTS TO INHIBIT CROSS-LINKING OF PROTEINS.
Technical rept. for Mar 63-Mar 65,
by Fred A. Andrews, David A. Thomson, and Chester E. Underwood. Aug 65, 19p. Contract DA19 129AMC71N Proj. 1K012501A034
USA-NLABS, FD-18

Unclassified report

Descriptors: (*Dehydrated foods, Antioxidants), (*Fats, Antioxidants), (*Ribose, Antioxidants), (*Carbohydrates, Antioxidants), (*Antioxidants, Effectiveness), Proteins, Fatty acid esters, Oxidation, Molecular isomerism, Linoleic acid, Enzymes, Meat, Vitamin B complex

A number of aldose sugars and ribose derivatives were studied manometrically and spectrophotometrically to access their potentials as antioxidants in dehydrated foods. Evidence is presented which indicates that aldoses containing cis hydroxyl configuration on carbon 2 and 3 of the molecule possess antioxidant properties. Ribitol, D-2deoxyribose and riboflavin were found to inhibit peroxidation of purified methyl linoleate. Ribose at very low concentrations was found to inhibit diene conjugation in methyl linoleate. (Author)

AD-620 977 Div. 16/3
NAVAL TRAINING CENTER GREAT LAKES ILL DENTAL RESEARCH FACILITY
ZONE ELECTROPHORESIS OF HUMAN PAROTID SALIVA IN ACRYLAMIDE GEL,
by T. S. Meyer, and B. L. Lamberts. Mar 65, 5p. Proj. MR005.12-5004.8

Unclassified report

Pub. in Nature v205 n4977 p1215-6 Mar 20 1965 (Copies available only to DDC users).

Descriptors: (*Saliva, Electrophoresis), (*Electrophoresis, Saliva), Proteins, Separation, Glycoside hydrolases, Gels, Amides

The report concerns an examination of acrylamide gel as another medium for the zone electrophoresis of parotid saliva proteins. Preliminary experiments with acrylamide-gel strips yielded protein patterns in which twenty or more fractions could be visually distinguished when the electrophoresis was carried out in 0.1 M tris-EDTAboric acid buffer at pH 9.0. Under the conditions of the experiment, more than half the staining components migrated anodically with generally better resolution than is evident for the cathodically-migrating components. Salivary amylase, a troublesome factor in the starch-gel electrophoresis of saliva proteins, does not attack acrylamide gel.

AD-621 165 Div. 16/3 ,16/4
CFSTI Prices: HC $1.00 MF $0.50
BRUSSELS UNIV (BELGIUM) LABORATOIRE DE MORPHOLOGIE ANIMALE
SULFUR COMPOUNDS IN MORPHOGENESIS.
Final technical rept.
4 May 65, 6p. Contract AF EOAR103 63
AFOSR , 65-1336

Unclassified report

Descriptors: (*Organic sulfur compounds, Metabolism), (*Morphology (Biology), Organic sulfur compounds), (*Nucleic acids, Biosynthesis), Eggs, Embryos, Amphibians, Chickens, Growth, Mitosis, Bacteria, Algae, Lipoic acids, Thiols, Belgium

Brief summaries are given of papers published under the grant, which concerns the effects of sulfur compounds on animal morphogenes and nucleic acid synthesis.

AD-621 179 Div. 16/3
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
IMMUNOCHEMICAL STUDIES ON BLOOD GROUPS. XXXIII. THE EFFECTS OF ALKALINE BOROHYDRIDE AND OF ALKALI ON BLOOD GROUP A, B, AND H SUBSTANCES,
by Elvin A. Kabat, Emmett W. Bassett, KatherinePryzwansky, Kenneth O. Lloyd, and Manuel E. Kaplan. 1965, 7p. Contract Nonr26613 Grant, NSF G18727

Unclassified report

Pub. in Biochemistry v4 n8 p1632-7 Aug 8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Blood groups, Immunology), (*Blood proteins, Degradation), Borohydrides, Alkali metal compounds, Alkaline earth compounds, Polysaccharides, Amino acids, Chromatographic analysis

Degradation of blood group A, B, and H substances by alkali with or without sodium borohydride causes destruction of almost all of the serine and threonine and of the internal N-acetylgalactosamine of the blood group substances. Some destruction of galactose also occurs. Most of the other amino acid constituents remained unchanged but some destruction of arginine and histidine was also found. In the presence of reducing agent, alphaaminobutyric acid and additional alanine were formed from threonine and serine and an additional peak was found on the chromatograms after valine. The findings suggest that oligosaccharide side chains bearing the A, B, and H determinants are linked to the serine and threonine probably by an N-acetylgalactosamine residue, but the possibility of linkage by a galactose cannot be excluded. (Author)

AD-621 180 Div. 16/3
COLUMBIA UNIV NEW YORK COLL OF PHYSICIANS AND SURGEONS
STUDIES ON HUMAN ANTIBODIES. III. AMINO ACID COMPOSITION OF FOUR ANTIBODIES FROM ONE INDIVIDUAL,
by Emmett W. Bassett, Stuart W. Tanenbaum, Katherine Pryzwansky, Sam M. Beiser, and Elvin A. Kabat. 5 Apr 65, 11p. Contract NSF GB 1560, NSF G18727

Unclassified report

Pub. in The Journal of Experimental Medicine v122 n2 p251-61 Aug 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Antigens + antibodies, Amino acids), (*Amino acids, Antigens + antibodies), Gamma globulin, Blood groups, Blood proteins, Chromatographic analysis, Immunology, Humans

Antilevan, antidextran, antiteichoic acid, anti- 'A' and normal gamma G, all isolated from a single human, as well as pooled gamma G and gamma M, were analyzed for amino acid content. Differences ranging from 7 to 32 residues were found among these antibodies in glycine, valine, leucine, tyrosine, arginine, lysine, and threonine content. These conspicuous differences in amino acid composition were not correlated with the Gm type of these antibodies. Hydroxylysine was found in two of the four antibodies, antidextran and antiteichoic acid, and in gamma M- immunoglobulin. No hydroxylysine was found in gamma G- globulins. These findings probably account for discrepancies in the literature concerning the occurrence of this residue in antibody protein. (Author)

AD-621 181 **See Fld. 6/16**

AD-621 268 Div. 16/3
CFSTI Prices: HC $1.00 MF $0.50
ARMY LIMITED WAR LAB ABERDEEN PROVING GROUND MD
BIOSENSING TECHNICS FOR HUMAN DETECTION. II. THE FROG SKIN TRANSDUCER: A CONTINUOUS FLOW SYSTEM FOR MAKING CRITICAL MEASUREMENTS.
Technical memo.,
by Alfred T. Kornfield, and Max Krauss. Aug 65, 19p. Rept. no. TM-65-02

Unclassified report

See also AD-609 436.

Descriptors: (*Transducers, Skin), (*Skin, Transducers), (*Humans, Warning systems), Amphibians, Membranes (Biology), Organic compounds, Measurement, Monitors, Identification

Earlier results in which transmembrane potential changes were elicited across frog belly skin by a number of compounds were duplicated. Four additional compounds were tested, including dimethyl sulfoxide. Dimethyl sulfoxide has no apparent adjuvant action when tested with urea. Measurements were attempted using low concentrations of test compounds by an expanded scale technique. The static 2-chamber cell is not suitable for this type of measurement. A continuous flow cell was assembled and tested. This system should permit critical measurement of effects of low concentrations of test substances and it also provides a point of departure for design studies leading to development of a practicable field detection instrument. (Author)

AD-621 285 Div. 16/3
FLORIDA STATE UNIV TALLAHASSEE
PHOTOCHEMISTRY AND METAL CATALYSIS: STUDIES ON A FLAVIN SENSITIZED OXIDATION OF ASCORBATE,
by Peter Homann, and Hans Gaffron. 27 Jul 64, 22p. Contract AT40 1 2687 Grant ,AF AFOSR62 190
AFOSR , 65-1286

Unclassified report

Pub. in Photochemistry and Photobiology v3 p499-519 1964 (Copies available only to DDC users).

Descriptors: (*Ascorbic acid, Oxidation), (*Photochemistry, Catalysis), (*Anthoxanthin pigments, Photochemistry), (*Herbicides, Photochemistry), Manganese, Ions, Oxygen, Antimetabolites, Chlorine compounds, Ureides, Complex compounds, Reaction kinetics, Iodides, Copper, Catalase, Ethylenedinitrilo tetraacetates

The paper constitutes a study of the interaction between ascorbate, diketogulonate, manganous ion, oxygen and illuminated flavins (or other sensitizers). When ascorbate is chosen as the substrate, the resulting photoxidation assumes a peculiar two-step course. This happens because traces of ascorbate inhibit the photoxidation of diketogulonate and oxygen retards the photoxidation of small amounts of ascorbate. Sensitized photo-reactions which are inhibited by high concentrations of oxygen are affected by the addition of various organic compounds. Of these, the herbicides 3-(p-chlorophenyl)-1,1-dimethylurea (CMU) and 3- (3, 4-dichlorophenyl)-1,1-dimethylurea (DCMU) interfere nearly exclusively with flavin sensitized photoreactions, while other inhibiting compounds tested, such as tryptophane and tyrosine, do not display a similar selectivity for only one dye. The response of flavin sensitized photoreactions to the addition of CMU or DCMU varies with the substrate being oxidized. It is concluded that herbicides like CMU form stable charge transfer complexes with excited flavin molecules.

AD-621 317 Div. 16/3 ,16/1
NEW YORK STATE UNIV BROOKLYN DOWNSTATE MEDICAL CENTER
THE UPTAKE OF DL-LYSINE-H3 INTO THE NERVOUS SYSTEM AS COMPARED WITH OTHER TISSUES IN EUTHYROID AND DYSTHYROIDAL MALE RATS,
by D. H. Ford, R. Rhines, M. Hartstein, and A. Rhodes. 1 Jul 64, 18p. Contract Nonr401800 Grant ,PHS NB04568 01

Unclassified report

Pub. in Acta Neurologiya Scandinavia v41 p215-32 1965 (Copies available only to DDC users).

Descriptors: (*Amino acids, Nervous system), (*Nervous system, Metabolism), (*Thyroxine, Central nervous system), Tissues (Biology), Thyroid gland, Diseases, Brain, Proteins, Nerve cells, Nerve fibers, Spinal cord, Chromatographic analysis, Labeled substances, Rats

In two separate experiments it was shown that DLLysine-H3 uptake is lower in hyperthyroid rats and higher in hypothyroid animals than normal. This is believed to be largely due to metabolic considerations which effect the turnover rate of amino acids in brain and tissue proteins rather than being related to an increase or decrease in the synthesis of the total amount of protein. It was observed that the brain reacted to variations in thyroid state of the animal in a manner comparable to other tissues. A method is described whereby one can study the uptake of lysine and presumably other amino acids into nerve cells. With lysine, enough labeled amino acid entered the cells to permit chromatographic identification of the injected material as well as quantitative counting by liquid scintillation procedures. Uptake of lysine into the ventral horn motor neurons of the spinal cord was 25 to 30 times higher than was observed in the ventral horn tissue as a whole. Thus, the total uptake in a region of mixed nerve cells, supporting tissues and nerve fibers reflects only the uptake in a heterogenous tissue where a relatively high concentration of amino acid uptake by nerve cells is camouflaged by the relatively low uptake in vascular and glial tissue. (Author)

AD-621 328 **See Fld. 6/15**

AD-621 329L **See Fld. 6/15**

AD-621 330 See Fld. 6/15

AD-621 335 See Fld. 6/16

AD-621 403 Div. 16/3
UNIVERSITY COLL GALWAY (EIRE) DEPT OF CHEMISTRY
AMINO ACID COMPOSITION AND C-TERMINAL RESIDUES OF ALGAL BILIPROTEINS,
by M. A. Raftery, and C. O. hEocha. 19 May 64, 7p. Contract AF61 052 409 Grant ,PHS AM02691 05
AFOSR , 65-1289
Unclassified report

In cooperation with California Univ., Berkeley. Dept. of Biochemistry. Pub. in Biochem. J. v94 p166-70 1965 (Copies available only to DDC users).

Descriptors: (*Algae, Chromoproteins), (*Chromoproteins, Algae), (*Amino acids, Algae), Biological pigments, Purification, Chemical analysis, Spectra (Visible + ultraviolet), Crystallization, Molecular structure, Erie

R-phycoerythrin from Ceramium rubrum and C-phycocyanin from Nostoc nuscorum were obtained in purified form by fractional crystallization, followed by chromatography and gel-filtration. The amino acid composition of both chromoproteins was determined; 85% of the total weight of both was recovered as amino acids. Alanine was identified as the only C-terminal amino acid of R-phycoerythrin, each molecule of which contained about 12 terminal groups. Serine was identified as the only C-terminal group of C-phycocyanin. (Author)

AD-621 404 Div. 16/3
LONDON UNIV (ENGLAND) DEPT OF BIOCHEMISTRY
METABOLIC AND ELECTRICAL MEASUREMENTS WITH ISOLATED CEREBRAL TISSUES: THEIR CONTRIBUTION TO STUDY OF THE ACTION OF DRUGS ON CORTICAL EXCITABILITY,
by Henry McIlwain. 1963, 25p. Contract AF61 052 404
AFOSR , 65-1497
Unclassified report

Pub. in Brain Function: Cortical Excitability and Steady Potentials; Relations of Basic Research to Space Biology; Proc Conf (1st) Los Angeles Calif 1961 Univ of Calif Press Brazier M A B v1 p49-71 1963 UCLA Forum Med Sci NI (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cerebral cortex, Stimulation), (*Metabolism, Cerebral cortex), (*Drugs, Cerebral cortex), Mammals, Tissues (Biology), Nerve cells, Nerve impulses, Nervous system, Physiology, Electrolytes (Physiology), Polarization, Anoxia, CNS depressants, CNS stimulants, Histological techniques, Symposia, Great Britain

Small portions of mammalian cerebral cortex were studied in isolation in order to determine what phenomena related to excitability are retained by the fragments, and the extent to which these phenomena are conditioned by the way the tissue is maintained and by the substances added to it. The electrical condition and the excitability of the tissues were of main concern. (Author)

AD-621 463 Div. 16/3
CITY OF HOPE MEDICAL CENTER DUARTE CALIF DEPT OF BIOCHEMISTRY
RESTORATION OF NORMAL GLUTAMIC ACID TRANSPORT IN VITAMIN B6-DEFICIENT LACTOBACILLUS PLANTARUM BY ACETATE, AMMONIUM, AND VITAMIN B6,
by Joseph T. Holden. 5 Nov 64, 18p. Contract Nonr270200 Grant ,PHS A101487 Proj. NR108 432
Unclassified report

Pub. in Biochimica et Biophysica Acta v104 p121-38 1965 (Copies available only to DDC users).

Descriptors: (*Glutamic acid, Vitamin B complex), (*Vitamin B complex, Deficiency diseases), (*Lactobacillus, Vitamin B complex), Acetates, Ammonium compounds, Chloramphenicol, Ribonucleic acids, Desoxyribonucleic acids, Amino acids, Penicillins, Cell wall, Synthesis, Osmosis

A vitamin B6-deficiency in Lactobacillus plantarum markedly reduces the amount of glutamate and other amino acids which can be taken up and accumulated from buffered solutions. The capacity for glutamate accumulation is restored to normal levels when acetate, ammonium, and pyridoxamine are included in the external buffer. The requirement for acetate was not satisfied by a large number of related organic acids. The stimulation of glutamic acid uptake occurred in the absence of significant changes in levels of cellular protein, RNA and DNA and was not inhibited by chloramphenicol. Cells pretreated with acetate, ammonium, and vitamin B6 were subsequently capable of accumulating nearly normal amounts of various amino acids in the absence of any supplemental additions to the buffer. This was true however, only if glutamic acid was included in the pretreatment solution. This requirement for glutamate during pretreatment to attain an expansion of amino acid accumulation capacity was specific and was observed regardless of which amino acid was subsequently used to measure the accumulation capacity. During pretreatment with acetate, ammonium, pyridoxamine, and glutamate there were substantial increases in cell-wall mass. Penicillin inhibited both the increases in cell wall mass and accumulation capacity. These findings support the hypothesis that the reduced capacity for amino acid accumulation by vitamin B6-deficient cells of L. plantarum arises from a failure to synthesize a normal cell wall.

AD-621 465 Div. 16/3
FLORIDA STATE UNIV TALLAHASSEE INST OF MOLECULAR BIOPHYSICS
THE ROLE OF LIGHT IN EVOLUTION: THE TRANSITION FROM A ONE QUANTUM TO A TWO QUANTA MECHANISM,
by Hans Gaffron. 1965, 26p. Contract AF AFOSR190 62 Proj. 9777 Task 977701
AFOSR , 65-1287
Unclassified report

Pub. in Origins of Prebiological Systems and of Their Molecular Matrices p437-60 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Porphyrins, Photochemistry), (*Photosynthesis, Theory), Light, Photons, Organic pigments, Water, Decomposition, Metabolism, Chlorophylls

The importance of light's role in evolution is investigated. It is hypothesized that the porphyrin pigments antedated the earliest living cell and that the anaerobic process, photoreduction, preceded and evolved into photosynthesis. The main problem in this evolutionary step was the photolysis of water. It is known that it is impossible to separate H from OH irreversibly and to release them as hydrogen and oxygen with the energy of only one red light quantum. Therefore it is suggested and evidence is presented to show that the main evolutionary step from an anaerobic process to an aerobic process was the transition from a one quantum to a two quanta mechanism. (Author)

AD-621 528 See Fld. 6/15

AD-621 591 Div. 16/3 ,4/3
CHICAGO UNIV ILL MUSEUM OF SCIENCE AND INDUSTRY
REACTION OF AMINO-ACIDS AND PEPTIDE BONDS WITH FORMALDEHYDE AS MEASURED BY CHANGES IN THE ULTRA-VIOLET SPECTRA,
by Leo. J. Saidel, Joel S. Satzman, and William H. Elfring,Jr.. 1965, 8p. Contract Nonr165501 Grant ,NIH GM09434 Proj. NR304 303
Unclassified report

Pub. in Nature v207 n4993 p169-71 Jul 10 1965 (Copies available only to DDC users).

Descriptors: (*Amino acids, Chemical reactions), (*Peptides, Chemical reactions), (*Formaldehyde, Chemical reactions), (*Ultraviolet spectroscopy, Proteins), Absorption spectrum, Chemical bonds, Amides, Chemical equilibrium, Reaction kinetics

Molar absorptivity changes 220 millimicrons during the reactions of mono- and di-amino acids, unsubstituted amides, and N-alkyl substituted amides with formaldehyde are reported and the implications are discussed.

AD-621 607 Div. 16/3 ,16/1
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
STIMULATION OF STEROID C-11 BETA HYDROXYLATION IN ADRENAL MITOCHONDRIA BY CYCLIC 3',5' ADENOSINE MONOPHOSPHATE,
by Sidney Roberts, John E. Creange, and Peggy L. Young. 1965, 6p. Contract Nonr23333 Grant, NSF GB2500 Proj. NR101 402
Unclassified report

Pub. in Nature v207 n4993 p188-90 Jul 10 1965. (Copies available only to DDC users).

Descriptors: (*Progesterone, Chemical reactions), (*Corticosteroid agents, Chemical reactions), (*Adenosine phosphates, Steroids), (*Mitochondria, Steroids), Alcohols, Nucleotides, Stimulation, Rats, Adrenal glands, Monocyclic compounds, Chromatographic analysis

It is shown that cyclic 3', 5'-adenosine monophosphate is capable of stimulating C-11 beta hydroxylation of progesterone and 11-deoxycorticosterone in purified rat adrenal mitochondria fortified with NADPH.

6/3. BIOLOGY

AD-620 957 See Fld. 2/3

AD-621 062 See Fld. 6/12

AD-621 104 Div. 16/4
GEORGETOWN UNIV WASHINGTON DC
PERFORMANCE FAILURE DURING HYPOTHERMIA,
by J. A. Panuska. 1964, 1p. Contract DA49 193MD2668
Unclassified report

Pub. in American Zoologist, v5 n2 p24 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Behavior, Hypothermia), (*Hypothermia, Behavior), Rats, Training, Stress (Physiology), Body temperature, Performance tests, Exposure

Shaved euthermic Long-Evans rats, 248 = 29 g males, in a 2C environment were trained to obtain external heat from an overhead heating lamp by lever-pressing. Steady performance for heat began after 2.0 = 1.2 hrs of exposure to the experimental situation and continued for the remainder of a 19 hr training session. Following the training session, heat loss was increased by moistening the skin of the animals and reducing the duration of the heat reinforcement from 4 sec to 1/3 sec. This effected a progressive hypothermia. Even though the rate of working for external heat increased greatly under this stress, the colonic temperature dropped

1C every 13.1 min. When the body temperature reached 25.5 = 1C heat reinforcement performance began to slow down. At 24.6 = 1C this performance stopped, several degrees above the onset of motor failure. This observation was supported by three additional series of experiments involving variations in the duration of training, periods of rest before testing in hypothermia, and means of achieving hypothermia. The body temperature at which previously trained animals failed to perform corresponds closely to a reported critical level for instrumental response acquisition by untrained animals. (Document quoted in its entirety.)

AD-621 129 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
UNIVERSITY COLL LONDON (ENGLAND)
THE TWO MEMORY SYSTEMS OF THE OCTOPUS.
Final rept.,
by J. Z. Young, G. Gray, M. Nixon, H. Maldonado, and T. Osman. 1965, 6p. Contract AF EOAR64 42
AFOSR . 65-1368

Unclassified report

Descriptors: (*Memory, Cephalopoda), (*Cephalopoda, Memory), Nerve cells, Nerve fibers, Behavior, Learning, Brain, Pain, Touch, Vision, Stimulation, Ribonucleic acids, Desoxyribonucleic acids, Autonomic nervous system, Great Britain

The report covers work in Naples and London June 1964-65 on the two memory systems of Octopus. Subsidiary investigations have included studies and efferent pathways for the systems for killing and eating the prey. The numbers of nerve cells and fibres involved, their diameters and conduction velocities have also been studied.

AD-621 165 **See Fld. 6/1**

AD-621 255 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
DIRECTORATE OF SCIENTIFIC INFORMATION SERVICES OTTAWA (ONTARIO)
THE EFFECT, ON ECHOLOCATION IN BATS, OF PARTIAL AND COMPLETE INHIBITION OF THE CEREBRAL CORTEX,
by A. I. Konstantinov. Aug 65, 5p. Rept. no. T-438-R
TT . 65-63963

Unclassified report

Trans. of Akademiya Nauk SSSR. Doklady, v161 n4 p989-91 1965.

Descriptors: (*Auditory signals, Bats), (*Bats, Cerebral cortex), Nervous system, Auditory perception, High frequency, Motor reactions, Flight, Inhibition, Behavior, USSR

AD-621 280 Div. 16/4 ,28/1
CFSTI Prices: HC $3.00 MF $0.75
CALIFORNIA INST OF TECH PASADENA
INSECT VISION.
Final rept.,
by D. M. Vowles. Jun 65, 93p. Contract AF AFOSR458 63
AFOSR . 65-1226

Unclassified report

Research performed in cooperation with Oxford Univ. (England). Inst. of Experimental Psychology. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Insects, Vision), Muscidae, Eye, Arthropods, Histological techniques, Mathematical models, Retina, Cornea, Adaptation (Physiology), Light, Intensity, Cells (Biology), Organic pigments, Graphics

The properties of a model describing optomotor responses in the housefly are listed. Some of these theoretical properties may be found empirically by histological and electrophysiological techniques. The parameters required are the interommatidial angle, the diameter of the receptive field of an ommatidium or retinula cell, and the relationship between the generator potential and light intensity. The interommatidial angle was measured histologically. This is variable over the whole eye, the most uniform region lying between 20 and 60 degrees in the horizontal plane (anterior = 0 degrees) and 30 degrees above and 10 degrees below horizontal in the vertical. The mean interommatidial angle in the horizontal plane is 3.9 degrees, and 2.5 degrees in the vertical. The role of screening pigment is examined. This is most dense in the upper part of the eye. During dark adaptation the pigment migrates, moving inwards away from the lenses and contracting outwards towards the pseudocone from deeper parts of the retina. This is discussed in relation to the optical system of the ommatidia, and it is suggested that the pigment migration will lead to a widening of the receptive field.

AD-621 318 Div. 16/4 ,23/4 ,30/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
EDUCATION IN BIOENGINEERING,
by Terence W. Murphy. Sep 65, 9p. Rept. no. P-3228

Unclassified report

Descriptors: (*Biology, Engineering), (*Education, Bionics), (*Engineering personnel, Biology), Physiology, Mathematical models, Mechanical organs

It is suggested that bioengineering has arisen as a separate discipline because of educational deficiencies in the fields of biology and engineering. If so, it would seem necessary to provide the bioengineering student with the best possible foundation in the (primarily mathematical) tools of system analysis, followed by engineering material currently in use in biological work, and a theoretical and practical study of mathematical models in physiology, coupled with thesis work in this last area. (Author)

AD-621 373 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
HAWAII UNIV HONOLULU
STUDIES ON SENSORY BASES OF INVERTEBRATE BEHAVIOR AND COMMUNICATION.
Final rept. for 15 Jul 63-30 Jun 65,
by Hubert Frings. 10 Aug 65, 15p. Contract Nonr421100 Proj. NR301 744

Unclassified report

Descriptors: (*Invertebrates, Behavior), (*Sensory perception, Invertebrates), Marine biology, Echinodermata, Mollusca, Crustacea, Archnids, Chemoreceptors, End organs, Sound, Stimulation, Growth, Reproduction (Physiology), Bibliographies, Hawaii

Bibliographies on chemoreception and mechanoreception of invertegrates have been accumulated and partly indexed. These contain about 4,000 references. Reviews of these fields, as well indexed bibliographies, are to be published. Simplified and inexpensive methods for maintaining marine invertebrates in captivity were developed. Various containers for sea water were used, with coarse coral sand over sub-sand filters. About 100 species from eight phyla were kept for periods of a few weeks to over two years, feeding directly only frozen brine shrimp. Equipment and methods for testing reactions of these small aquatic organisms to simple contact, moving contact, D.C. pressure, A.C. pressure, liquid-borne sound, solid-borne sound (vibration), D.C. water-streams, and A.C. water-streams were developed. Some pieces of equipment were calibrated fully for quantitative studies. With these, 30 species of marine invertebrates, from four phyla, were studied comparatively. A limited study was also made on reactions of three species of sea anemones and two species of opisthobranch molluscs to noxious stimuli, chiefly burning. Regional sensitivity is marked, and the reactions indicate special behavior patterns related to noxious stimulation. The reactions of three species of web-spinning spiders to air-borne sounds, web vibrations, and air-streams were studied comparatively. The reactions are not the same, and different receptors are involved for vibrations than for the other two.

AD-621 415 Div. 16/4
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
IDENTIFICATION KEYS TO THE ADULT AND LARVAL MOSQUITOES OF THE MEDITERRANEAN AREA,
by William P. DuBose, and Thomas J. Curtin. 1965, 8p.

Unclassified report

Pub. in Journal of Medical Entomology v1 n4 p349-55 Jan 15 1965 (Copies available only to DDC users).

Descriptors: (*Culicidae, Morphology (Biology)), Mediterranean Sea, Adults, Larvae, Identification

Adult and larval keys are given for 72 of 83 species known in the Mediterranean area. (Author)

AD-621 493 Div. 16/4
GEORGETOWN UNIV WASHINGTON DC DEPT OF BIOLOGY
FAILURE OF HEAT REINFORCEMENT PERFORMANCE BY TRAINED ANIMALS DURING HYPOTHERMIA,
by J. A. Panuska. 30 Apr 65, 8p. Contract DA49 193MD2668

Unclassified report

Pub. in Cryobiology v1 n5 p334-40 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hypothermia, Motor reactions), Performance tests, Rats, Training, Body temperature, Exposure, Skin, Moisture, Behavior, Learning, Stress (Physiology)

Shaved, euthermic, male Long-Evans rats weighing 248 = 29 g, in a 2C environment, were trained to obtain external heat from an overhead heating lamp by lever pressing. Steady performance for heat began after 2.0 = 1.2 hr of exposure to the experimental situation and continued for the remainder of a 19-hr training session. Following the training session heat loss was increased by moistening the skin of the animals and reducing the duration of the heat reinforcement from 4 sec to 1/3 sec. This effected a progressive hypothermia. Even though the rate of working for external heat increased greatly under this stress, the colonic temperature dropped 1C every 13.1 min. When the body temperature reached 25.5 = 1.0C, heat reinforcement performance began to slow down. At 24.6 = 1.0C, this performance stopped, several degrees above the onset of motor failure. This observation was supported by three additional series of experiments involving variations in the duration of training, periods of rest before testing in hypothermia, and means of achieving hypothermia. The body temperature of 24.6 = 1.0C at which previously trained animals failed to perform corresponds closely to a reported critical level for instrumental response acquisition by untrained animals. (Author)

AD-621 494 Div. 16/4
GEORGETOWN UNIV WASHINGTON DC DEPT OF BIOLOGY
INSTRUMENTAL SHOCK ESCAPE PERFORMANCE DURING HYPOTHERMIA,
by J. A. Panuska. 1965, 1p. Contract DA49 193MD2668

Unclassified report

Pub. in Cryobiology v2 p23-4 1965 (Copies not available to DDC or Clearinghouse customers.)

Descriptors: (*Hypothermia, Behavior), Rats, Performance tests, Body temperature, Training, Skin, Moisture

Performance ability during progressive hypothermia has been tested with shock escape procedures. Male Long-Evans rats, 271 = 21 g., were trained to press a lever to receive a 20-sec escape from a scrambled 0.6-ma grid shock. During training, the mean response latency diminished from a pretraining level of 6 sec to 1.5 sec after 80 trials. Performance remained at this level or better during subsequent training. The animals were shaved and placed in the behavioral chamber at an ambient temperature of 4C. With occasional moistening of the skin, their body temperatures gradually lowered. Mean response latencies began to increase at a colonic temperature of 29C and reached pretraining levels by 25C. From previous studies on positive reinforcement and the present results, it appears that the body temperature of 23 to 25C is a critical zone for instrumental performance. (Author)

AD-621 585 Div. 16/4
CFSTI Prices: HC $1.00 MF $0.50
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
CURRENT REFERENCES IN MEDICAL ENTOMOLOGY FROM RUSSIAN, CENTRAL AND EASTERN EUROPEAN AND CHINESE LITERATURE, VOL. IV, NO. 9,
by Alena Elbl. 1965, 22p. Contract DA49 193MD2238
TT , 65-64002
Unclassified report

Descriptors: (*Insects, Disease vectors), (*Disease vectors, Bibliographies), Ticks, Mites, Diptera, Siphonaptera, Lice, Bacteria, Spirochaeta, Protozoa, Rickettsia, Virus diseases, Infectious diseases, Parasitic diseases, Insecticides, USSR, Eastern Europe, China

6/5. CLINICAL MEDICINE

AD-620 960 Div. 16/13
CALIFORNIA UNIV LOS ANGELES DEPT OF SURGERY
THE EFFECTS OF NUCLEIC ACIDS ON HOMOGRAFT TOLERANCE,
by Franklin L. Ashley, Earl G. McNall, N. R. Dutt, Eugene N. Garcia, and Robert F. Sloan. 1960, 12p. Contract DA49 007MD646
Unclassified report

Pub. in Annals of the New York Academy of Sciences v87 p429-40 May 31 1960 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ribonucleic acids, Transplantation), (*Transplantation, Nucleic acids), (*Tolerances (Physiology), Transplantation), Desoxyribonucleic acids, Skin, Tissues (Biology), Liver, Spleen, Thymus, Genetics, Antigens + antibodies, Cells (Biology), Immunology, Rats

RNA derived from both the skin and various visceral organs of Long-Evans rats induced homograft tolerance when injected into recipient Wistars prior to the transplant of skin. Liver, spleen, and thymus RNA was quantitatively more effective than skin RNA. When control animals were injected with RNase-hydrolyzed RNA, it was observed that the treated RNA was unable to induce tolerance. Furthermore, RNA derived from rats unrelated to either donor or recipient was unable to induce tolerance. Homograft tolerance was induced in both donor and recipient animals to varying extents. Explanations of this unexpected phenomenon in the donor animals are discussed. (Author)

AD-620 961 Div. 16/13
CALIFORNIA UNIV LOS ANGELES DEPT OW6 SURGERY
FURTHER STUDIES ON THE EFFECT OF RIBONUCLEIC ACID ON HOMOTRANSPLANTATION TOLERANCE,
by Franklin L. Ashley, Earl G. McNall, Robert F.Sloan, N. R. Dutt, and Eugene N. Garcia. 1960, 6p. Contract DA49 007MD646
Unclassified report

Pub. in Plastic and Reconstructive Surgery v26 n5 p530 -4 Nov 1960 (Copies not available to DDC or Clearinghousr customers). Prepared for presentation at Meeting of the American Association of Plastic Surgeons, Milwaukee, Wis. 19 May 60.

Descriptors: (*Ribonucleic acids, Transplantation), (*Transplantation, Ribonucleic acids), (*Tolerances (Physiology), Transplantation), Immunology, Cells (Biology), Antigens + antibodies, Histology, Skin, Liver, Spleen, Thymus, Rats

RNA, isolated from both the skin and various visceral organs of Long Evans rats, induced homograft tolerance when injected into recipient neonatal Wistar rats before the transplant of skin. The RNA derived from thymus, spleen, and liver was quantitatively more effective than skin RNA in inducing tolerance. The histological appearance of tolerant grafts, and of grafts at various stages of rejection, did not differ from tolerance induced by cells in previously reported studies. (Author)

AD-620 962 Div. 16/13
CALIFORNIA UNIV LOS ANGELES DEPT OF SURGERY
FURTHER STUDIES IN THE SURVIVAL OF SKIN HOMOGRAFTS AS A FUNCTION OF QUANTITY AND FREQUENCY OF RNA INJECTIONS,
by Franklin L. Ashley, D. Berman, and J. Jessamy. 1963, 3p. Contract DA49 007MD646
Unclassified report

Pub. in American Journal of Surgery v105 n2 p174-6 Feb 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ribonucleic acids, Transplantation), (*Transplantation, Ribonucleic acids), (*Tolerances (Physiology), Transplantation), Skin, Liver, Spleen, Thymus, Reticulo-endothelial system, Rats

RNA prepared from the spleens of adult Wistar rats induced prolonged homograft survival when injected into neonatal Long Evans recipients, before the transplant of skin. The RNA derived from the spleen was at least as effective as the combined RNA prepared from either liver, spleen and thymus, or skin. The period of homograft survival increased with increasing quantity and frequency of RNA injection. (Author)

AD-621 014 Div. 16/13
CFSTI Prices: HC $11.05 MF $3.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PLANNING LOCAL-PLASTIC OPERATIONS IN THE SURFACE OF BODY; THEORY AND PRACTICE MANUAL FOR SURGEONS,
by A. A. Limberg. 25 Jun 65, 905p. Rept. no. FTD-MT-64-228
TT , 65-63939
Unclassified report

Edited machine trans. of mono. Planirovanie Mestnoplasticheskikh Operatsii na Poverkhnosti Tela; Teoriya i Praktika Rukovodstvo Dlya Khirurgov, Leningrad, 1963 p1-595. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Plastic surgery, Surgical techniques), Skin, Transplantation, Wounds + injuries, Tissues (Biology), Body, Humans, Mathematical analysis, Geometry, USSR

The publication is intended for physician-surgeons, traumatologists, orthopedists, stomatologists and otorhinolaryngologists. Numerous methods of skinplastic restoration of the correct form of the body surface and normal mobility in the region of joints are expounded. Concepts about the necessity of preliminary clear planning of plastic operations and on the possibility of clear foresight of the results of such operations are introduced. The monograph is illustrated

AD-621 335 See Fld. 6/16

6/8. FOOD

AD-620 884 Div. 29/2
CFSTI Prices: HC $3.00 MF $0.75
MIDWEST RESEARCH INST KANSAS CITY MO
DEVELOPMENT OF FOOD BARS EMPLOYING EDIBLE STRUCTURAL AGENTS.
Technical rept.,
by Harry E. Newlin, and E. R. Morris. Aug 65, 93p. Contract DA19 129QM1984 Proj. 7X84 06 031
USA-NLABS , FD-20
Unclassified report

Descriptors: (*Military rations, Dehydrated foods), (*Dehydrated foods, Processing), Meat, Vegetables, Cerals, Milk, Adhesion, Storage, Preparation, Deformation, Drop testing, Shear stresses, Shock resistance, Impact shock, Humidity, Tables

Several pastes and a hot melt prepared from edible components were found effective binders for preparation of bars from any combination of dry foods. Effectiveness of these edible binders was demonstrated on bars prepared from different types and compositions of foods. Bars remained acceptable after storage for three months at 100F. and retained adequate resistance to impact and shear. (Author)

AD-620 885 See Fld. 6/1

AD-620 935 Div. 29/2
CFSTI Prices: HC $3.00 MF $0.75
EVANS RESEARCH AND DEVELOPMENT CORP NEW YORK
ALL-PURPOSE MATRIX FOR MOLDED FOOD BARS.
Technical rept.,
by Eric J. Hewitt. Aug 65, 88p. Contract DA19 129AMC2111 Proj. 1K643303D548
USA-NLABS , FD-14
Unclassified report

Descriptors: (*Military rations, Dehydrated foods), (*Dehydrated foods, Processing), Lactose, Carboxymethylcellulose, Freeze-drying, Storage, Stability, Odors, Taste, Hydrogenation, Specifications, Tests, Tables

The object of the program was to produce a suitable matrix for various food components (soups, beverages and casseroles) which would not detract from the basic flavor of the major food components. A satisfactory matrix was made from lactose (99%) and sodium carboxymethylcellulose (1%). The matrix can be produced successfully by tray-drying or freezedrying. This report summarizes the work performed in Phase I and Phase II of the contract and gives the results of the various shelf-life tests. In general, the lactose/ carboxymethylcellulose matrix performed well over the broad range of products that were tested. (Author)

6/12. MEDICAL AND HOSPITAL EQUIPMENT AND SUPPLIES

AD-620 857 Div. 16/8 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR BIOELECTRICALLY CONTROLLING, E.G., OF PROTHESES,
by E. P. Polyan. 19 Aug 65, 6p. Rept. no. FTD-TT-65-508
TT , 65-63877
Unclassified report

Unedited rough draft trans. of Russian patent 163 326, pub. 27 Jul 63, appl. 843963/31-16, 2p.

Descriptors: (*Prosthetics, Control systems), (*Nerve impulses, Prosthetics), Resistors, Capacitors, Transistors, Feedback, Relays, Circuits, Patents, USSR

The object of the invention is a device for bioelectrically controlling, for example protheses, having resistor, capacitor, and transistors, and which is characterized by the fact that, for the purpose of assuring subsequent control of two pairs of movements from two independent signal sources, an electronic switch-relay is mounted in it, built on two transistors, being activated at simultaneous feeding of two signals of negative polarity and switching over the control from one pair of movement to another. For the purpose of controlling the second pair of movements, an RC (circuit), which maintains the circuit in switched over condition for a period of time necessary to execute the beginning of the movement, and automatically returning the circuit into initial position when the feeding of the control signal has been discontinued. (Author)

AD-621 062 Div. 16/8 ,16/4 ,30/5
CFSTI Prices: HC $4.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTRON MICROSCOPY METHODS OF INVESTIGATION OF BIOLOGICAL OBJECTS,
by V. I. Biryukova, V. L. Borovyagin, V. P. Gilev, N. A. Kiselev, and A. S. Tikhonenko. 13 Apr 65, 250p. Rept. no. FTD-MT-64-149
TT , 65-63947

Unclassified report

Edited machine trans. of mono Elektronnomikroskopiches
kie Metody Issledovaniya Biologicheskikh Ob-'ektov, Moscow, 1963 p1-203.

Descriptors: (*Electron microscopy, Biology), Electron microscopes, Optical equipment components, Photographic film, Photographic contrast, Bacteria, Viruses, Tissues (Biology), Histological techniques, Biological stains, Calibration, USSR

Basic methods of investigating biological objects are outlined. Special features of biological preparations which impart characteristic features to the process of preparing specimens are examined. Methods of contrasting with the help of shadowing, dyeing with salts of heavy metals, and also the method of 'negative' contrasting are examined in detail. Various means of preparing replicas are described. The questions of fixation and dehydration of objects and the methodology of preparing ultrathin sections are examined in detail. Some practical problems of working with the electron microscope and questions of photographic technique are outlined briefly. (Author)

AD-621 281 Div. 16/8 ,30/3
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE MARSEILLE (FRANCE)
PRESSURE CHAMBER FOR MICROELECTROPHYSIOLOGICAL TECHNIQUES (CAISSON DE COMPRESSION POUR TECHNIQUES MICROELECTROPHYSIOLOGIQUES),
by Roger Chagneux. 23 Oct 64, 13p. Contract AF EOAR63 114 ,NIH NB03337 Proj. 9777 Task 977701
AFOSR , 65-1294

Unclassified report

Pub. in Bull Inst Oceanogr Monaco v61 n1287 p1-8 1964 (Copies available only to DDC users). Text in French with Summary in English.

Descriptors: (*Pressure vessels, Laboratory equipment), (*Biological laboratories, Pressure vessels), Pressure, Remote control systems, High-pressure research, Gases, Nerve cells, Nervous system, Physiology, Marine biology

This research program on the effect of hyperbar gases on isolated nerve cells of 'Aplysia' has involved the study and construction of a pressure chamber. The chamber is mainly composed of a cylindrical tube, with 2 glass portholes allowing the illumination and observation of the biological preparations, and 2 moveable doors with a quickclosing system which permit micromanipulation. Electrical connections assure all the various remote controls. Two taps, purge and stop, a manometer and a safety valve complete the equipment of the chamber. The equipment meets the requirements of microelectrophysiological techniques and can submit the preparations to constant pressures of as much as 6 bars. (Author)

6/13. MICROBIOLOGY

AD-620 933 Div. 16/2 ,16/10
CFSTI Prices: HC $2.00 MF $0.50
NATIONAL CASH REGISTER CO DAYTON OHIO CAPSULAR RESEARCH AND PRODUCT DEVELOPMENT DIV
ENCAPSULATION OF VIRUSES.
Rept. for Mar-Oct 64,
by Jerrold L. Anderson, and S. David Butz. Aug 65, 40p. Contract AF29 601 6344 Proj. 8803

WL , TR-64-167

Unclassified report

Descriptors: (*Viruses, Encapsulation), (*Encapsulation, Bacteriophages), (*Bacteriophages, Encapsulation), Viability, Toxicity, Ethyl cellulose, Space biology, Radiation effects, Radiological dosage, Dosimeters, Photographic emulsions

Research efforts were directed toward development of a method of encapsulating viruses in spheres containing a predictable phage titer to be used in biological dosimetry experiments. Initial studies demonstrated the ability of the bacteriophage to undergo lyophilization and encapsulation yielding a product of adequate viability. The Butarez Toluene Ethylcellulose encapsulation system proved satisfactory for producing spheroidal virusethylcellulose capsules of twenty-five to fifty microns diameter, the mean diameter being forty-two microns. Viability determinations yielded a phage titer of 1.7 x 10 to the 11th power phages per gram of capsules; hence, a capsule of average diameter possessed a theoretical titer of 8 x 1000 phages. Simulated end-use tests proved photographic developer chemicals, such as could be used for the processing of virus-bearing nuclear emulsions, to be nontoxic to the encapsulated phages. A modification in the scope of the program directed the concluding work to the preparation of capsules less than fifteen microns in diameter. Samples of virusethylcellulose capsules were submitted to the Air Force. (Author)

AD-621 105 **See Fld. 2/5**

AD-621 111 Div. 16/2
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
STAINING OF VACCINIA ANTIGEN BY IMMUNOURANIUM TECHNIQUE,
by Edward J. Donati, Frank H. J. Figge, and LudwingA. Sternberger. 10 Oct 64, 11p. Rept. no. crld special Pub. 2-64

Unclassified report

Pub. in Experimental and Molecular Pathology v4 n1 p126-9 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Vaccinia virus, Biological stains), (*Biological stains, Vaccinia virus), Antigens + antibodies, Morphology (Biology), Electron microscopy, Helium, Lanthanum, Immune serums, Preparation; Cell wall, Cytoplasm

An attempt to follow morphologically the development of vaccinia antigen in helium-lanthanum (HeLa) cells is reported. The conversion of rabbit antisera to vaccinia virus and the preparation of vaccinia-infected HeLa cells for electron microscopy are described. With specific staining, viral particles were found 14 hr after infection. They were characterized by wall staining and, in most instances, absence of core staining. Two types of localization were observed. In one type, the particles were scattered in small clusters in the cytoplasm. The remaining sections of cytoplasm contained large, specifically stained masses consisting of closely packed, viral particles and amorphous stained material. The former type of localization also showed staining in areas beyond the confines of viral particles that was not noted in control sections. (Author)

AD-621 122 Div. 16/2
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
INDIRECT IMMUNOURANIUM TECHNIQUE FOR STAINING OF IMBEDDED ANTIGEN IN ELECTRON MICROSCOPY,
by John J. Cuculis, Edward J. Donati, John P. Petrali, and Ludwig A. Sternberger. 12 Oct 64, 21p. Rept. no. crdl special pub. 2-63

Unclassified report

Pub. in Experimental and Molecular Pathology v4 n1 p112-25 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Antigens + antibodies, Biological stains), Immune serums, Uranium, Gamma globulin, Absorption (Biological), Electron microscopy, Bordetella, Purification, Immunology, Sheep, Rabbits

Sheep antibody to rabbit antibody was immunospecifically protected during extensive chelation with uranium in a procedure that consisted of the following steps: (1) insolubilization of rabbit gamma-globulin (RGG) by coupling with diazotized p-aminobenzylcellulose, (2) specific absorption of antibody, (3) exposure of antibody -- RGG -- p-azobenzylcellulose to uranyl acetate solution, and (4) elution of antibody by alkali. The antibody was from 40% to 75% pure and contained from 29 to 90 atoms of uranium per molecule. Antigen localized by specific rabbit antiserum became electron dense on treatment with immunospecially purified and protected, uranium-conjugated sheep antibody to rabbit antibody. Pretreating sections with benzene-saturated water facilitated staining after sectioning for electron microscopy. Irreversible structural changes increasing the size and solvation of the molecule were affected by alkali treatment of unprotected, uranium-chelated areas in antibody and gamma-globulin. Protected sites did not appreciably participate in these changes. (Author)

AD-621 332 Div. 16/2
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
LABORATORY INVESTIGATION OF ARCTIC STRAINS OF RABIES VIRUS,
by Robert A. Crandell. 31 Oct 64, 10p.

Unclassified report

Pub. in Acta path et microbiol scandinav v63 p587-96 1965 (Copies available only to DDC users).

Descriptors: (*Rabies virus, Diagnosis), Identification, Antigens + antibodies, Fluorescence, Morphology (Biology), Immune serums, Histological techniques, Biological stains, Tissues (Biology), Brain, Cytoplasm, Nerve cells, Mice, Guinea pigs, Hamsters, Rabbits

Viruses identified as rabies by the demonstration of negri bodies in experimental animals, immunofluorescence technic, and serum-virus neutralization tests were isolated from animals from Greenland. In comparing several laboratory diagnostic methods for detection of the virus, the fluorescent antibody technic and mouse inoculation method were shown to be equally sensitive. Rabbits, guinea pigs, white mice, and hamsters were susceptible to infection by different routes of inoculation.

Hamsters were found to be more susceptible than white mice for primary isolation. Rabbits were more refractory than the other species studied. In addition to various types of cytoplasmic inclusion bodies, intranuclear inclusions were demonstrated in nerve cells of some brains of laboratory-infected animals. (Author)

AD-621 338 Div. 16/2 ,16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
CYTOCHEMICAL OBSERVATIONS ON INTRANUCLEAR INCLUSION OF FELINE VIRAL RHINOTRACHEITIS VIRUS,
by Robert A. Crandell, and David F. Hersey. 26 Jun 63, 4p.

Unclassified report

Pub. in Proceedings of The Society for Experimental Biology and Medicine v114 p187-90 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Viruses, Tissue culture cells), (*Tissue culture cells, Cytochemistry), (*Cytochemistry, Viruses), Cytology, Biological stains, Histological techniques, Nuclei (Biology), Cytoplasm, Desoxyribonucleic acids, Morphology (Biology)

Examination of feline renal cell cultures infected with feline viral rhinotracheitis virus and stained by the MayGrunwald-Giemsa, acridine orange, and the Feulgen techniques showed that there were definite morphological alterations with biochemical changes within the cell. The evidence suggests that the cytologic changes occurred in the nucleus first. The development of the inclusion body was accompanied by an increase in staining reaction for desoxyribonucleic acid in the nucleus. The Feulgen technique revealed a decrease in staining intensity of the nucleus in the later stages of inclusion development. Such results were not obtained with the May-GrunwaldGiemsa and acridine orange stains. With these latter 2 staining methods the terminal stages of infection were characterized by an increased accumulation or redistribution of desoxyribonucleic acid-staining material in the cytoplasm. (Author)

AD-621 390 Div. 16/2 ,16/1
JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MICROBIOLOGY
INHIBITION OF GUINEA PIG C'2 BY RABBIT ANTIBODY. QUANTITATIVE MEASUREMENT OF INHIBITION, DISCRIMINATION BETWEEN IMMUNE INHIBITION AND COMPLEMENT FIXATION, SPECIFICITY OF INHIBITION AND DEMONSTRATION OF UPTAKE OF C'2 BY EAC'LA,4,
by Manfred M. Mayer, and Jimmie A. Miller. 23 Sep 64, 23p. Contract Nonr24860 Grant ,NSF G19372 Proj. NR108 104

Unclassified report

Pub. in Immunochemistry v2 p71-93 1965 (Copies available only to DDC users).

Descriptors: (*Complement, Immunology), (*Immunology, Complement), Antigen-antibody reactions, Hemolysis, Erythrocytes, Immune serums, Antigen + antibodies, Inhibition, Absorption, Guinea pigs, Rabbits, Mammals

On repeated inoculation with alum-precipitated, partially purified guinea pig C'2, rabbits form antibody which inhibits the hemolytic activity of C'2. A sensitive method has been designed for precise quantitative measurement of inhibiting anitbody. The procedure excludes the possibility of complement fixation and, hence, the inhibitory effect is attributed to steric hindrance. The shape of the anti-C'2 neutralization curve indicates that a single molecule of antibody suffices for inhibition of C'2, and that the C'2 molecule can bind several molecules of neutralizing antibody. Quantitative inhibition analyses indicate that C'2 physically combines with EAC'la,4 to yield the intermediate EAC'la,4,2a. (Author)

AD-621 467 Div. 16/2
LOBUND LAB UNIV OF NOTRE DAME IND
THE USE OF GERMFREE ANIMALS IN VIRUS RESEARCH,
by M. Pollard. 1965, 15p.

Unclassified report

Pub. in Progr. med. Virol. v7 p362-76 1965 (Copies available only to DDC users).

Descriptors: (*Germ-free animals, Medical research), (*Virus diseases, Germ-free animals), Laboratory animals, Rodents, Antigens + antibodies, Blood serum, Tissue culture cells, Tissue extracts, Excretion, Pathology, Diseases

Contents: Search for viruses in germfree rodents; Appearance of signs and symptoms suggestive of disease; Detection of serum antibodies against known viral agents; Detection of cytopathogenic agents in tissue cultures prepared from germfree tissues; Induction of cytopathogenic effects in germfree tissues by extracts of tissues and excretions of germfree animals; Detection of cytopathology in the tissues of germfree animals; Susceptibility of germfree rodents to standard strains of viral agents, and chemical oncogenic agents; Detection of virus in germfree mice; Application to virus research.

AD-621 503 Div. 16/2
LOBUND LAB UNIV OF NOTRE DAME IND
EFFECT OF X RADIATION AND CORTISONE ON MOUSE HEPATITIS VIRUS INFECTION IN GERMFREE MICE,
by Philip P. Vella, and Theodore J. Starr. 18 Nov 64, 7p. Contract Nonr162314

Unclassified report

Pub. in the Journal of Infectious Diseases, v115 p271-7 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Germ-free animals, Hepatitis viruses), (*Hepatitis viruses, Germ-free animals), X rays, Corticosteroid agents, Toxins + antitoxins, Reticulsendothelial system, Antigens + antibodies, Virus diseases, Rats, Therapy

Cortisone of X radiation treatment reduced the native resistance of both germfree and conventional adult mice to infection with mouse hepatitis virus. A cortisone-virus challenge was more detrimental to conventional mice than to germfree mice, a result which may be attributed to the deleterious side effects of their normal microbial flora. The greater susceptibility of germfree mice to a 600 roentgen-virus challenge after 2 weeks may be due to additive but unrelated effects of X radiation. Germfree mice pretreated with either triolein or endotoxin became more resistant to a cortisone-virus challenge. This increased resistance is attributed, in part, to a hyperactive reticuloendothelial system. (Author)

AD-621 508 **See Fld. 6/15**

AD-621 544 **See Fld. 11/5**

AD-621 617 Div. 16/2
NATIONAL RESEARCH COUNCIL OF CANADE OTTAWA (ONTARIO) DIV OF BIOSCIENCES
THE FORMATION OF SPHERULITIES IN PELLICLES OF BACTERIAL CELLULOSE,
by J. Ross Colvin. 29 Mar 65, 6p. Rept. no. NRC-8505

Unclassified report

Pub. in Canadian Journal of Microbiology, v11 p641-3 1965. (Copies available only to DDC users).

Descriptors: (*Pseudomonadaceae, Cellulose), (*Cellulose, Pseudomonadaceae), Morphology (Biology), Growth, Culture media, Crystallization, Spheres, Polymers, Synthesis, Electron microscopy, Canada

Two-dimensional analogues of spherulites are formed in the pellicle of bacterial cellulose produced by static cultures of Acetobacter xylinum. These spherulites are much larger (sometimes more than 1 cm diameter) than those usually observed in other natural or synthetic polymers. They are due to the radial orientation of bacterial cellulose microfibrils in limited regions of the plane of the pellicle. These spherulites interact to form characteristic, dendritic structures of great complexity which resemble leaves of higher plants. (Author)

AD-621 618 Div. 16/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF BIOSCIENCES
DISTRIBUTION OF PROTEINASE IN CULTURES OF A SPECIES OF MICROCOCCUS IN SYNTHETIC MEDIUM,
by I. J. McDonald. 27 Jan 65, 9p. Rept. no. NRC-8506

Unclassified report

Pub. in Canadian Journal of Microbiology v11 p693-701 1965 (Copies available only to DDC users).

Descriptors: (*Micrococcus, Peptide hydrolases), (*Peptide hydrolases, Micrococcus), Culture media, Growth, Ph, Enzymes, Enzyme precursors, Canada

Cultures of Micrococcus sp. (ATCC No. 407) in synthetic medium contained proteinase giving optimum casein hydrolysis at pH 5.7-6.3. The proteinase (named pH 5.7 proteinase) was found in the supernatant fluid of centrifuged cultures; the amount in the medium increased during the log phase of growth and reached a maximum just before cultures entered the maximum stationary phase. The occurrence of pH 5.7 proteinase in the external medium did not seem to be associated with cell lysis. Cells harvested at intervals during growth of cultures contained a small, nearly constant amount of pH 5.7 proteinase suggesting the enzyme is liberated by cells at about the same rate as it is formed. No evidence was obtained to suggest that cells contained inactive proenzyme or precursor. Cells contained peptidase activity and pH 7.0 proteinase (optimum casein hydrolysis at pH 7.0). These enzymes were liberated when cells were ruptured and apparently are produced by cells independently of pH 5.7 proteinase. (Author)

6/15. PHARMACOLOGY

AD-620 832 Div. 16/11,4/4 ,4/3 ,3/7
CFSTI Prices: HC $1.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
KINETICS OF THE DETERIORATION OF TRIMETHYLENE BIS- (4-FORMYL PYRIDINIUM BROMIDE) DIOXIME IN DILUTE AQUEOUS SOLUTIONS,
by Robert I. Ellin, D. E. Easterday, Peter Zvirblis, and Albert A. Kondritzer. Jun 65, 25p. Rept. no. CRDLR-3278
Proj. 1C622401A097

Unclassified report

Descriptors: (*Oximes, Degradation), (*Pyridines, Degradation), Bromides, Hydrolysis, Dehydration, Reaction kinetics, Catalysis, Thermochemistry, pH, Temperature

The degradation of trimethylene bis- (4-formyl pyridinium bromide) dioxime (TMB-4) occurs by two mechanisms: a hydrolytic reaction of the acid form of the oxime catalyzed by hydrogen ion and a dehydration reaction. The latter may proceed by either of two pathways: a hydroxyl-ion-catalyzed dehydration of the acid form of the oxime or a spontaneous dehydration of the oximate species. Velocity and various thermodynamic constants were determined for each of the mechanisms postulated. General equations were derived

that relate the half life of TMB-4 solutions to pH and temperature. (Author)

AD-621 079 Div. 16/11,4/4
CFSTI Prices: HC $4.00 MF $0.75
MARQUETTE UNIV MILWAUKEE WIS DEPT OF CHEMISTRY
ELECTROCHEMICAL STUDIES OF ANTIRADIATION DRUGS. RADIATION EFFECT ON PROTEINS IN THE ABSENCE AND PRESENCE OF THESE DRUGS.
Annual rept. no. 4 (Final),
by Walter Stricks. 17 Sep 65, 112p. Rept. no. 241
Contract DA49 193MD2146
Unclassified report

Descriptors: (*Radioprotective agents, Electrochemistry), (*Organic sulfur compounds, Radioprotective agents), Quantitative analysis, Thiols, Sulfonates, Sulfides, Radiation effects, Blood proteins, Absorption spectrum, Albumins, Bovines, Ultraviolet radiation, Viscosity, Optical properties, Volumetric analysis

The work deals with polarographic and other electrochemical studies of radiation protective agents containing sulfhydryl, disulfide and thiosulfonate groups. These studies were applied to the quantitative determination of sulfhydryl and disulfide compounds by argentimetric and mercurimetric amperometric titration. Using these methods, it is possible to determine the sulfhydryl groups formed in bovine plasma albumin solutions after exposure to ultra violet light. The formation of sulfhydryl groups is explained by the rupture of disulfide during irradiation, one disulfide group giving rise to one sulfhydryl group. Also the polarographic catalytic effect of radiation protective drugs and of plasma albumin solution after irradiation in the absence and presence of these drugs was studied. The splitting of disulfide upon irradiation is accompanied by changes of the viscosity, optical rotation and light absorption in the ultraviolet region. The relationship between changes of these properties and the number of broken disulfide groups was demonstrated. (Author)

AD-621 167 Div. 16/11,16/10
CFSTI Prices: HC $1.00 MF $0.50
LUND UNIV (SWEDEN) DEPT OF PHARMACOLOGY
CHEMICAL SENSITIVITY OF SKELETAL MUSCLE.
Final technical rept.,
by Stephen Thesleff. 31 May 65, 6p. Contract AF EOAR12 63 Proj. 9777 Task 977701
AFOSR , 65-1367
Unclassified report

Descriptors: (*Neuromuscular transmission, Pharmacology), (*Musculoskeletal system, Pharmacology), Musculoskeletal diseases, Muscles, Nerve cells, Stimulation, Skeletal muscle relaxants

The parameters of transmitter release from mammalian motor nerve terminals were evaluated by electrophysiological techniques. The amount of transmitter available for immediate release, the rate of transmitter mobilization and synthesis have been determined under a variety of experimental conditions and in myasthenia gravis. (Author)

AD-621 181 See Fld. 6/16

AD-621 185 Div. 16/11,28/3
DEFENCE RESEARCH MEDICAL LABS TORONTO (ONTARIO)
THE EFFECT OF AMPHETAMINE ON THE DETECTABILITY OF SIGNALS IN A VIGILANCE TASK.
Research paper,
by Jane F. Mackworth. 29 Oct 64, 7p. Rept. no. DRML-RP-576
Unclassified report

Pub. in Canad. J. Psychol./Rev. Canad. Psychol. v19 n2 p104-10 1965 (Copies are available only to DDC users).

Descriptors: (*Amphetamines, Attention), (*Attention, Amphetamines), Signals, Detection, Performance (Human), Perception (Psychology), Reaction (Psychology), Learning, Analysis of variance, Canada

Ten mg. of di-amphetamine sulphate or placebo were given to 56 Ss in three successive runs on a vigilance task requiring detection of a brief pause in the steady movement of a clock hand. Signals occurred at a rate of three a minute. Amphetamine had the same effect on the percentage of signals detected as on the detectability of the signals, as measured by d'. The initial level was unchanged, but the decrement was reduced. No evidence of learning was found in later runs. The effects of amphetamine and knowledge of results were additive. (Author)

AD-621 328 Div. 16/11,16/3
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
A RAPID AND SPECIFIC METHOD FOR DETERMINING ETHCHLORVYNOL,
by Jack E. Wallace, and William J. Wilson,Jr.. 24 Mar 64, 12p.
Unclassified report

Pub. in Journal of Forensic Sciences v9 n3 p342-52 July 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hypnotics + sedatives, Chemical analysis), Blood, Urine, Absorption spectrum, Chlorine compounds, Alcohols

A rapid, specific method for the quantitative determination of ethchlorvynol in biological materials is presented. The method involves formation of a carbonyl derivative of ethchlorvynol in acid solution, steam distillation of the carbonyl compound and formation of its semicarbazone and final spectrophotometric determination of its absorbancy, which follows the Beer-Lambert law over a wide range. The method if sufficiently sensitive to permit determinations of the drug in blood and urine after ordinary, therapeutic doses. (Author)

AD-621 329L Div. 16/11,16/3
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
A RAPID AND SPECIFIC SPECTROPHOTOMETRIC METHOD FOR DETERMINING PROPOXYPHENE,
by Jack E. Wallace, John D. Biggs, and Elmer V.Dahl. 15 Mar 65, 14p.
Unclassified report

Pub. in Journal of Forensic Sciences v10 n2 Apr 1965 (Copies not available to DDC or Clearinghouse customers). Presented at the Annual Meeting of the American Academy of Forensic Sciences, (17th) Chicago, Ill., 25 Feb 1965.

Descriptors: (*Analgesics + antipyretics, Chemical analysis), (*Narcotics, Chemical analysis), Amines, Alcohols, Esters, Blood, Urine, Spectra (Visible + ultraviolet), Absorption spectrum, Excretion

AD-621 330 Div. 16/11,16/3
USAF EPIDEMIOLOGICAL LAB LACKLAND AFB TEX
DETERMINATION OF DIPHENYLHYDANTOIN BY ULTRAVIOLET SPECTROPHOTOMETRY,
by Jack Wallace, John Biggs, and Elmer V. Dahl. 4 Jan 65, 4p.
Unclassified report

Pub. in Analytical Chemistry v37 n3 p410-3 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Anticonvulsants, Chemical analysis), (*Hydantoin, Chemical analysis), Blood, N-heterocyclic compounds, Ultraviolet spectroscopy, Degradation, Hydrolysis, Distillation, Absorption spectrum

A method for determining diphenylhydantoin permits analysis for that substance in blood in the presence of other drugs without preliminary separation by extraction. In the procedure, hydrolysis of the hydantoin ring in strong alkali is followed by a Hofmann degradation of the resulting amide to yield a steam-distillable product. Hydrolysis and degradation proceed spontaneously, permitting immediate steam distillation of the product which, in contrast to diphenylhydantoin, has a high molar absorptivity in the ultraviolet region. It has a well defined maximum at 257 millimicrons and a minimum at 228 millimicrons. The method is rapid and, for forensic toxicologic purposes, is specific for diphenylhydantoin. It is sufficiently sensitive for the determination of diphenylhydantoin in therapeutic concentration in the blood. (Author)

AD-621 436 See Fld. 5/10

AD-621 508 Div. 16/11,16/10,16/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
A BIOASSAY OF THE PROMINENT HUMORAL AGENTS INVOLVED IN ENDITOXIN SHOCK.
Technical rept. for Nov 63-Jul 64,
by James A. Vick. Mar 65, 17p. Rept. no. CRDLR-3269
Proj. 1C522301A079
Unclassified report

Descriptors: (*Toxins + antitoxins, Allergy), (*Allergy, Toxins + antitoxins), Escherichia coli, Parasympatholytic agents, Biological assay, Blood vessels, Histamine, Hypotension, Cardiovascular diseases, Epinephrine, Levarterenol, Vasoactive agents

This report defines the release of neurohumoral substances into the circulation after the intravenous administration of a lethal dose of E. coli endotoxin. An isolated saphenous vein in circuit with either an intact or a surgically eviscerated dog allowed the measurement of vessel-tension changes and afforded a continuous bioassay of the existing neurohumoral balance; blocking agents were used to define the agent that was active at any one given time. Histamine, or a similar compound, was active in the first phase of shock with catecholamines playing the predominant role during the second hypotensive phase. A parasympathetic-like response (third phase), causing bradycardia and hypotension, was also noted. (Author)

AD-621 509 Div. 16/11
CFSTI Prices: HC $1.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
A STUDY OF DRUG RECEPTORS IN THE ISOLATED RABBIT AORTA STRIP.
Technical rept. for Apr-Jul 63,
by Nelson L. Adams, and Edmund Bay. Mar 65, 20p. Rept. no. CRDLR-3267
Task 1A012501B02802
Unclassified report

Descriptors: (*Acetylcholine, Aorta), (*Aorta, Acetylcholine), Drugs, Dosage, Reserpine, Atropine, Epinephrine, Muscles, Contraction, Thresholds (Physiology), Pharmacology, Sympatholytic agents, Sympathomimetic agents, Vasoactive agents, Rabbits

An investigation was made to determine whether the action of acetylcholine is caused by the release of catecholamine from stores in the aortic wall or whether there is a cholinoreceptive site in this tissue. Isotonic contractions were recorded using isolated helical strips of rabbit aorta suspended in a bath of 95 percent 0 sub 2and 5 percent CO sub 2- saturated, phosphate-buffered Kreb's solution maintained at a constant temperature of 37 degrees C. Acetylcholine, epinephrine, and antagonists to each (atropine, dichloroisoporterenol) were added directly to the tissue-bathing fluid with

a syringe. Epinephrine and acetylcholine, at dose levels used, have only excitatory effects on the isolated rabbit aorta. At no concentration of acetylcholine was a relaxing effect observed. The sensitivity of the muscle to epinephrine and to acetylcholine is in the ratio of 1:100; the threshold concentration for epinephrine is 1 X 10 to the power of minus 8 M. The rabbit aorta has a distinct myogenic cholinoreceptive site, and the excitatory effect is not caused by a catecholamine releasing mechanism, which possibly exists in other parts of the vascular tree. (Author)

AD-621 528 Div. 16/11,16/3 ,16/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
5-HYDROXYTRYPTAMINE RELEASE BY BRAIN SLICES.
Technical rept. for Sep 61-Jul 63,
by Malcolm B. Bowers Jr., Stanford T. Roodman, and Margaret G. Filbert. Jun 65, 18p. Rept. no. CRDLR-3298
Proj. 1A012401B028

Unclassified report

Descriptors: (*Brain, Serotonin), (*Serotonin, Biological assay), Rats, Central nervous system, Hydrazine derivatives, Reserpine, Enzymes, Inhibition

Brain slices from the rat were allowed to respire for 2 hr in a modified Tyrode's solution containing the monoamine oxidase inhibitor 1-phenyl-2-hydrazinopropane (alpha-methyl phenyl hydrazine, JB-516). The filtered Tyrode's solution was shown to contain 5-hydroxytryptamine (Serotonin, 5-HT) by both bioassay and fluorometric techniques. Preliminary evidence indicates that the amount of 5-HT in the filtrate is increased significantly by adding reserpine and JB-516 to the incubation medium. These findings suggest that a sensitive bioassay procedure, coupled with the use of brain slices, offers an approach for the study of factors affecting the storage and release of endogenous 5-HT. (Author)

6/16. PHYSIOLOGY

AD-620 810 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MAN AND OUTER SPACE,
by V. Tomakov. 12 Aug 65, 10p. Rept. no. FTD-TT-65-602
TT , 65-63853

Unclassified report

Unedited rough draft trans. of Sovetskii Krasnyi Krest (USSR) v10 n1 p12-3 1960.

Descriptors: (*Space flight, Manned), (*Astronautics, USSR), Satellites (Artificial), Astronauts, Acceleration tolerance, Hypoxia, Weightlessness, Life support, Pressure suits, Radiation hazards, Space biology

AD-620 829 Div. 16/1
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
SOME MORPHOLOGICAL FEATURES OF CATECHOLAMINE STORING NERVE VESICLES,
by U. S. von Euler, and G. Swanbeck. 1964, 2p. Contract AF EOAR64 31 ,NIH NB04432 02

AFOSR , 65-1302

Unclassified report

Pub. in Acta Physiol. Scand. v62 p487-8 1964 (Copies available only to DDC users).

Descriptors: (*Nerve cells, Morphology (Biology)), Granules, Bovines, Spleen, Biological stains, Particles, Levarterenol, Autonomic nervous system, Sweden

Subcellular particles rich in noradrenaline have been obtained from homogenized bovine splenic nerves. After staining with phosphotungstic acid, the existence of granules 0.03 - 0.1 micron in diam was noted. A characteristic feature is the occurrence of notches, which often were extended to tail-like structures on opposite sides of the granules. Frequently the vesicles occurred in pairs and sometimes even in short chains. This is suggestive of a system similar to granular formation in the Golgi apparatus, which might mean that the granules are arranged in a type of lattice in the axon, and presumably in the terminals. (Author)

AD-620 879 Div. 16/1
CFSTI Prices: HC $2.00 MF $0.50
NAVY EXPERIMENTAL DIVING UNIT WASHINGTON D C
CALCULATION OF DECOMPRESSION SCHEDULES FOR NITROGEN-OXYGEN AND HELIUM-OXYGEN DIVES.
Research rept.,
by Robert D. Workman. 26 May 65, 42p. Rept. no. RR-6-65
Proj. SF011 06 05 Task 11514

Unclassified report

Descriptors: (*Diving, Decompression), (*Decompression, Numerical method and procedures), (*Respiration, Decompression), Helium, Oxygen, Mixtures, Nitrogen, Tables, Theory, Decompression sickness

This report presents the theoretical basis for calculation of decompression schedules for nitrogen-oxygen and heliumoxygen mixtures used in diving. It includes definitions, theory of exponential saturation and desaturation, and theory of limiting values of excess saturation permitted at various ambient pressures with helium and nitrogen. An attempt has been made to simplify the presentation of the calculation procedure to implement the theoretical method. The necessary tables and worksheets used in calculations are presented, together with sample calculations of dive schedules. The discussion describes and appraises other methods of calculation developed in recent years. (Author)

AD-620 916 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
GEOSCIENCE LTD LA JOLLA CALIF
THERMAL AND ELECTRICAL CONDUCTIVITIES OF BIOLOGICAL FLUIDS AND TISSUES.
Quarterly rept. for 1 Apr-30 Jun 65,
by Heinz F. Poppendiek, Norman D. Greene, R. Randall, and P. M. Morehouse. 30 Jun 65, 18p. Rept. no. GLR-37
Contract Nonr409500

Unclassified report

See also AD-615 299.

Descriptors: (*Body fluids, Electrical conductance), (*Tissues (Biology), Thermal conductivity), (*Blood, Freezing), Erythrocytes, Cryogenics, Blood plasma, Storage, Preservation, Additives, Hemolysis, Bovines, Brain, Kidneys, Liver, Stress (Physiology)

The results of several erythrocyte settling experiments in vertical and horizontal electrical conductivity cells indicated that removal of all cells from blood samples prior to the conductivity measurements insures removal of the settling parameter. Experimental time variations in the electrical conductivity of blood that had previously been cryogenically stored are noted to be small but as yet inconclusive. Comparison of conductivity results for plasma of blood that had been cryogenically stored with and without PVP additive were significantly different, the preserved blood having lower hemolysis and higher conductivity. The thermal conductivities of bovine brain, kidney, and liver were measured after these specimens were slowly frozen to 0C and then slowly thawed; the conductivities increased approximately 10 percent above values obtained for corresponding unstressed specimens. The corresponding conductivity changes for samples that were cryogenically frozen and more quickly warmed were smaller. Anaytical thermal conductivity models were compared to experimental data obtained previously; good correlations of the results were obtained. (Author)

AD-620 922 Div. 16/10
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
EXPERIMENTAL INVESTIGATIONS OF FLASH BLINDNESS,
by John Lott Brown. 1964, 16p. Contract Nonr55149 Grant ,PHS B2205

Unclassified report

Pub. in Human Factors p503-16 Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Flashblindness, Aviation medicine), Vision, Retina, Damage, Visual acuity, Adaptation (Physiology), Thresholds (Physiology), Pilots, Nuclear weapons, Illumination, Luminescence, Light, Eyeglasses, Safety devices, Equations

The problem of short term blindness following exposure to intense flashes of light has important practical implications for military aviators in the atomic age. Experimental studies of flash blindness are reviewed and the physiological bases for the phenomenon are inferred for a wide range of conditions. Several methods of developing a descriptive equation are considered and an empirical formulation is presented. (Author)

AD-620 925 Div. 16/1 ,16/15
PENNSYLVANIA UNIV PHILADELPHIA DEPT OF PHYSIOLOGY
RESPONSES OF SINGLE UNITS OF THE CAT VISUAL SYSTEM TO RECTANGULAR STIMULUS PATTERNS,
by G. Baumgartner, J. L. Brown, and A. Schulz. 22 May 64, 20p. Contract Nonr55149 Grant, PHS B2205

Unclassified report

Pub. in J. Neurophysiol v28 p1-18 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Vision, Nervous system), (*Cerebral cortex, Vision), Optic nerve, Stimulation, Light, Illumination, Nerve cells, Physiology, Cats

Responses of single units of the visual system of the cat to a large uniformly illuminated field and to rectangular distributions of light stimulation in various positions and orientations were measured with glass microelectrodes. Several conclusions have been drawn from this work: a) Neural units with concentric field organization may be found in the cortex as well as in more peripheral portions of the visual system of the cat. Changes in the organization of neuronal response patterns would thus appear to occur within the cortex rather than between the lateral geniculate body and the cortex. b) Lateral activation by on-center units appears to provide a reasonable explanation of the on-activity of off-center units in response to contrasting stimulus patterns. The results are discussed in relation to contrast phenomena. (Author)

AD-620 931 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB OHIO
INTERDISCIPLINARY MEASUREMENT OF HUMAN PERFORMANCE UNDER LOW AND ZERO GRAVITY CONDITIONS,
by Duane Frank Kasten. 1964, 14p.

Unclassified report

Descriptors: (*Weightlessness, Performance (Human)), (*Maneuverability, Weightlessness), Rotation, Posture, Gravity, Space environmental conditions, Pilots, Measurement

A discussion is presented of research techniques used by experimental psychologists, anthropologists, physiologists, and engineers in studying human performance under low and zero gravity conditions.

AD-620 933 See Fld. 6/13

AD-620 944 Div. 16/1
NEW YORK STATE UNIV BUFFALO DEPT OF PHYSIOLOGY
HYPERBARIC OXYGEN AND PERSISTENCE OF VISION IN RETINAL ISCHEMIA.
Technical rept.,
by R. Carlisle, E. H. Lanphier, and H. Rahn. 7 Feb 64, 8p. Rept. no. TR-1-65
Contract Nonr96903 Grant .NIH HTS5508
Proj. NR102 511

Unclassified report

Pub. in Journal of Applied Physiology v19 n5 p914-8 Sep 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Vision, Pressure breathing), (*Pressure breathing, Vision), Oxygen consumption, Barometric pressure, Blackout (Physiology), Blood analysis, Tissues (Biology), Retina, Tolerances (Physiology)

When retinal ischemia is produced by elevating the intraocular tension, normal vision persists for about 4 sec in healthy subjects breathing air at atmospheric pressure. Persistence times were determined at alveolar oxygen pressures up to 4 atm abs (3,000 mm Hg), obtained by oxygen breathing in a high-pressure chamber. Below an alveolar PO2 of 2 atm the rise in persistence time is relatively small. Above that level the time increases in direct proportion to the increase in alveolar PO2 and may exceed 50 sec at 4 atm. The rise of persistence time follows a pattern similar to that of computed blood oxygen pressure assuming an oxygen extraction of about 3 vol%. (Author)

AD-620 945 Div. 16/1
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
EXCITATORY AND INHIBITORY BALDDER RESPONSES TO STIMULATION OF THE CEREBRAL CORTEX IN THE CAT,
by R. Gjone, and J. Setekleiv. 6 Mar 63, 14p.
Contract AF EOAR36 62 Proj. 9777 Task 977701
AFOSR . 65-1290

Unclassified report

Pub. in Acta physiol scand. v59 p337-48 1963 (Copies available only to DDC users).

Descriptors: (*Urinary system, Stimulation), (*Cerebral cortex, Stimulation), Cannulation, Pressure, Contraction, Inhibition, Rhythm (Biology), Nervous system, Physiology, Cats, Norway

A continuous intravesical pressure recording was established in 22 anesthetized cats by operative canalization of the bladder cavity, leaving the urinary outlet intact. The intravesical pressure variations caused by controlled volume changes were studied, and the alterations in bladder activity in response to stimulation of the cerebral cortex were recorded. The following excitatory bladder reactions on cortical stimulation are described: augmentation of the rhythmic contractions, dropwise expulsion of the bladder contents with incomplete emptying of the vesical cavity and, finally, a normal micturition act with forceful detrusor contractions. With regard to inhibitory effects the following responses were obtained: reduction or complete inhibition of the rhythmic bladder activity, arrest of the urination act or suppressed micturition. In aggreement with previous investigations excitatory bladder responses were obtained from the first sensory-motor area and from the anterior cingulate region. In addition, excitatory effects were elicited by stimulation of the anterior ectosylvian and anterior sylvian gyri (the somatic sensorymotor area II). Previous observations of inhibitory influence on bladder activity from the first sensory-motor area were confirmed. In addition, inhibitory effects were produced from the somatic sensory-motor area II, the subcallosal part of the anterior cingulate region and the orbital gyrus. All the various types of bladder reactions described above were obtained from any of these regions. (Author)

AD-620 947 Div. 16/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MAN IN A STATE OF WEIGHTLESSNESS,
by A. Kitaev-Smyk. 1 Jun 65, 19p. Rept. no. FTD-TT-65-146
TT . 65-63901

Unclassified report

Unedited rough draft trans. of Nauka i Zhizn (USSR) v31 n9 p16-21 1964.

Descriptors: (*Weightlessness, Experimental data), Space flight, Spacecraft, Astronauts, Vestibular apparatus, Motion sickness, Vision, Performance (Human), Colors, Motion, USSR

Contents (discourse presumably on experiences of man during weightlessness): Where does weightlessness exist. How did we investigate weightlessness. What sensual organs perceive weightlessness. What do people feel in state of weightlessness. About sea sickness Vision in weightlessness How are various colors visible in weightlessness. Vision and movements Is it easy to work in weightlessness.

AD-620 949 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THRESHOLDS OF CALORIC NYSTAGMUS DURING ROTATION AT CONSTANT SPEED,
by I. V. Orlov. 9 Jun 65, 10p. Rept. no. FTD-TT-65-216
TT . 65-63903

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady v156 n4 p972-5 1964.

Descriptors: (*Vestibular apparatus, Rotation), (*Eye, Oscillation), Thresholds (Physiology), Temperature, Stress (Physiology), Space medicine, USSR

The purpose of the work was to get the quantitative characteristics of the excitation of the vestibular apparatus at the time of quite lengthy rotation at constant speed. To this end there was developed a procedure for determining the thresholds of excitability in accordance with the calorific (temperature) test. The index proved to be cervical nystagmus.

AD-620 967 Div. 16/10
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE EFFECTS OF X-IRRADIATION ON GASTRIC MOTILITY IN THE DOG,
by Chu Jen-pao, and Shih Shou-chien. 25 Jun 65, 15p. Rept. no. FTD-TT-64-910
TT . 65-63908

Unclassified report

Edited trans. of Sheng Li Hsueh Pao (Chinese People's Republic) v24 n3/4 p220-6 1961.

Descriptors: (*Radiation effects, Gastrointestinal system), (*Gastrointestinal system, Radiation effects), Pathology, Radiological dosage, Radiation sickness, Whole body irradiation, X rays, Sublethal dosage, Lethal dosage, Central nervous system, Stomach, Motion, China

Sublethal doses of x-irradiation did not have a pronounced effect on the motility of the empty stomach in dogs. The characteristic changes were increased strength of contraction and rapid recovery. A lethal dose of radiation caused a marked change in gastric motility. Immediately after the irradiation, gastric motility disappeared. Although the motility resumed subsequently, a sustained normal state was seldom reached. If the depression occurred, in most cases chances for full recovery were nil. In a few animals, after the first depression, the gastric motility fluctuated for several months before returning to normal. If, however, a second depression occurred after an extended normalization period, death usually followed. The extent of the gastric motility alteration may be used as an index to the severity of the radiation syndrome, as a basis for understanding of the nature of the gastrointestinal disturbance in radiation sickness, and eventually for its treatment. Since gastric motility is under the regulation of the CNS, its changes may also reflect the state of the CNS. (Author)

AD-620 970 Div. 16/1 ,16/10
CFSTI Prices: HC $3.00 MF $0.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INFLUENCE OF ELEVATED INTRAPULMONARY PRESSURE ON RESPIRATION AND CIRCULATION,
by B. A. Botvinnikov, I. Sh. Ginzburg, P. M. Gramenitskii, G. I. Ivanov, and O. I. Ivchenko. 17 Jun 65, 72p. Rept. no. FTD-TT-65-154
TT . 65-63911

Unclassified report

Unedited rough draft trans. of Funktsii Organizma v Usloviyakh Izmenennoi Gazovoi Sredy (USSR) v1 p118-60 1955.

Descriptors: (*Respiration, Pressure), (*Pressure breathing, Blood circulation), Lungs, Muscles, Blood vessels, Blood pressure, Thorax, Abdomen, Relfexes, Respiratory diseases, Cardiovascular diseases, Arrhythmia, USSR

The changes in respiration under elevated intrapulmonary pressure, which take the form of an initial respiratory arrest, a subsequent retardation of respiration rate, and disruption of the normal relationships of the time and character of inhalation and exhalation (activation and intensification of exhalation), result principally from stimulation of the vagus receptors located in the pulmonary tissue. The extent and character of the respiratory changes depend on the exhalation and inhalation pressure. The principal role in exhalation during respiration under pressure is played by the muscles of the prelum abdominale. The coordination of the functioning of the abdominal muscles and the true respiratory musculature during respiration under pressure is disrupted after bilateral vagotomy in the cervical region. At identical elevated intrapulmonary pressures the changes in circulation depend on the character of the pressure. In contrast to intermittent pressure, constant pressure causes more substantial circulatory disturbances, as manifested in a greater decrease in arterial pressure and a larger increase in venous pressure.

AD-621 078 Div. 16/1
CFSTI Prices: HC $3.00 MF $0.75
HARVARD UNIV BOSTON MASS MEDICAL SCHOOL
MOLECULAR STRUCTURE AND DIFFUSIONAL PROCESSES ACROSS INTACT EPIDERMIS.
Final comprehensive summary rept. for Jul 64-Jul 65,
by Robert J. Scheuplein. Jul 65, 61p. Contract DA18 108AMC148A

Unclassified report

See also AD-603 244.

Descriptors: (*Membranes (Biology), Semipermeability), (*Skin, Semipermeability), (*Alcohols, Penetration), Water, Diffusion, Tissues (Biology), Dipole moments, Thermodynamics, Lipoproteins, Solubility, Porosity, Molecular structure, Heat of activation

The penetration rate for small molecular weight alcohols is approximately given by the expression: Js = Kp Km dCs, where Kp = 0.001-3 cm/hr. is essentially the permeability constant for water in the membrane, Km is the membrane-water partition coefficient for the alcohol and dCs is the con-

centration difference across the membrane. The activation energy for the penetration water and the polar alcohols, through hydrated stratum corneum is approximately 15 Kcal/mole. Extensive immersion in water effects the 'barrier' function of stratum corneum only slightly; principally by opening 'pores' which contribute to the diffusion a parallel flux which is relatively small above room temperature. Penetration through the stratum corneum is not primarily intercellular or appendageal. The hydrated stratum corneum seems to be best described as a dense, effectively homogeneous phase into which small molecular weight polar non-electrolytes dissolve with strong chemical interaction and through which diffusion occurs remarkably slowly. (Author)

AD-621 082 Div. 16/9
ARMED FORCES INST OF PATHOLOGY ARMY MEDICAL CENTER WASHINGTON D C
ENDEMIC GOITRE AND IODINE MALNUTRITION IN IRAQ,
by J. E. Caughey, and Richard H. Follis,Jr.. 1964, 7p.
Unclassified report

Pub. in The Lancet, p1032-4 May 15 1965 (Copies available only to DDC users).

Descriptors: (*Public health, Iraq), (*Deficiency diseases, Iodine), Adolescents, Nutrition, Etiology, Water supplies, Thyroid gland, Urine

Clinical studies of goitre in northern Iraq reveal a high prevalence of endemic goitre. Studies of urinary iodine levels in adolescent girls indicate that the main cause of the endemic is iodine malnutrition. The iodine content of water from the Tigris in the affected areas is low. (Author)

AD-621 083 Div. 16/1 ,16/12,28/3
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF
NEUROLOGICAL FINDINGS AFTER PROLONGED SLEEP DEPRIVATION,
by John J. Ross. 17 Nov 64, 5p. Contract NSF GB922 Task MR005 12 2304
Unclassified report

Pub. in Archives of Neurology, v12 p399-403 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sleep, Physiology), Vision, Space perception, Touch, Speech, Fatigue (Physiology), Neurology, Medical examination, Thresholds (Physiology), Electroencephalography, Behavior, Cerebral cortex, Abnormal psychology

A case of a 17-year-old male who was sleep-deprived for 264 hours is described, and the previously reported cases of prolonged wakefulness (greater than 120 hours) are briefly reviewed. Psychiatrically the patient experienced the visual misperceptions, temporal disorientation, cognitive disorganization, and tactual misperceptions that others had experienced, but at the end of the vigil he was psychiatrically much healthier. During the vigil he showed difficulty with focusing his eyes, stereognosis, equilibrium, and speaking. Multiple neurological examinations demonstrated that aside from quite evident physical and mental fatigue, the patient showed no significant abnormalities. (Author)

AD-621 167 **See Fld. 6/15**

AD-621 181 Div. 16/10,16/3 ,16/11
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
TREATMENT OF HEPATOLENTICULAR DEGENERATION (WILSON'S DISEASE) IN THE ASYMPTOMATIC STAGE.
Research rept.,
by Jun-Bi Tu, William C. Cooper, R. Quentin-Blackwell, and Tsung-Yung Hou. 1964, 9p.
NAVMED , MR005.09-1901.2.10
Unclassified report

Pub. in Neurology Minneapolis v15 n4 p402-8 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Copper, Metabolic diseases), (*Metabolic diseases, Copper), Liver, Brain, Central nervous system, Kidneys, Cornea, Tissues (Biology), Liver function tests, Electroencephalography, Psychometrics, Histological techniques, Vitamin B complex, Blood chemistry, Drugs, Toxicity, Diet, Therapy, Genetics, Pathology, Neurology, Taiwan

A 5-year-old Chinese girl with hepatolenticular degeneration was studied. Her disease, although asymptomatic, had already casued electroencephalographic abnormalities, altered liver function, and histologically demonstrable liver damage. The patient was treated for sixteen months with low copper diet, DL-penicillamine, and pyridoxine hydrochloride. Results of electroencephalograms, intelligence tests, liver function tests, and liver biopsy examinations improved after long-term treatment. Copper metabolic studies were done and are discussed. The importance of the copper balance study as a parameter in guiding treatment is emphasized. The favorable results are attributed to early treatment and maintenance of negative copper balance. (Author)

AD-621 182 Div. 16/1
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
TRANSPORT OF SODIUM AND WATER BY RABBIT ILLEUM, IN VITRO AND IN VIVO.
Research rept.,
by A. H. G. Love, T. G. Mitchell, and E. M. Neptune,Jr.. 1965, 3p. Rept. no. MR005.09-1040.1.20
Unclassified report

Pub. in Nature v206 n4989 p1158 Jun 12 1965 (Copies available to DDC users). Supported in part by Public Law 480, Section 104c.

Descriptors: (*Intestines, Permeability), Electrolytes (Physiology), Absorption (Biological), Transport properties, Sodium, Calcium, Ions, Water, Glutamine, Glucose, Membranes (Biology), Mucus, Labeled substances, Rabbits

AD-621 183 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
HAEMOGLOBIN H DISEASE AMONG CHINESE RESIDENTS OF TAIWAN.
Research rept.,
by Kuo Sin Lin, Ting-Chien Lee, Tsung-Cho Lu, Jeanette Tung-Hsiang Huang, and R. Quentin Blackwell. 1965, 9p. Rept. no. MF022.03.07-2004.7
Unclassified report

Pub. in Acta haemat. v33 p178-85 1965 (Copies available only to DDC users). Supported in part by Public Law 480 Section 104c.

Descriptors: (*Blood diseases, Hemoglobin), (*Hemoglobin, Blood diseases), Anemias, Hematocrit, Blood counts, Erythrocytes, Leukocytes, Hemolysis, Hematology, Electrophoresis, Taiwan

Six cases of haemoglobin H disease among 5 Chinese families in Taiwan were studied. The haematological findings resembled those of previous reports and included the occurrence of the electrophoretically fast H haemoglobin component; a slight elevation in the haemoglobin F; normal amounts of haemoglobin A2; diminished red cell osmotic fragility; and the presence of red cell inclusion bodies, target cells, poikilocytosis, and reticulocytosis. The patients exhibited varying degrees of anaemia which in some cases caused little disability but which in one patient was sufficiently severe to cause death. The anaemias were microcytic and hypochromic in 4 of the 6 cases. The severity of the anaemia in the patient who died made classification difficult. The sixth case, a sister of the patient who died, had a normocytic hypochromic anaemia. (Author)

AD-621 225 Div. 16/10
INDIANA UNIV MEDICAL CENTER INDIANAPOLIS
EFFECT OF OXYGEN BREATHING AT ONE ATMOSPHERE ON THE SURFACE ACTIVITY OF LUNG EXTRACTS IN DOGS.
Final rept. for Mar-Aug 64,
by P. R. B. Caldwell, W. L. Lee Jr., S. T. Giammona, and S. Bondurant. Mar 65, 10p. Contract AF33 616 8378 ,Grant PHS HE08240 Proj. 7164 Task 716404
AMRL , TR-65-136
Unclassified report

Pub. in Annals of New York Academy of Sciences v121 p823-8 Mar 24 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Oxygen consumption, Toxicity), Barometric pressure, Controlled atmospheres, Respiratory system, Lungs, Tissue extracts, Surface tension, Edema, Respiratory diseases, Pathology, Dogs

Atelectasis and edema have been described in the lungs of animals dying from exposure to a pure oxygen environment. Because of the importance of the surface tension properties of the lining layer of the alveoli in maintaining alveolar stability and fluid filtration and absorption balance in the lung, the effects of oxygen breathing at one atmosphere on the surface activity of lung extracts in dogs were examined. The conclusions of this study were: (1) Prolonged breathing of 98 per cent oxygen at one atmosphere is fatal to the dog after an average of 67 hours exposure. (2) There is loss of surface activity of lung extracts associated with severe pulmonary damage after 54 hours of exposure under these conditions. (Author)

AD-621 240 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C IMMUNOBIOLOGY BRANCH
THE ROLE OF CIRCULATING ANTIBODY IN THE REJECTION OF HOMOGRAFTS,
by Arthur M. Silverstein, and Keith L. Kraner. 12 Dec 64, 8p. Proj. 6X61 01 001 03
Unclassified report

Pub. in Transplantation v3 n4 p535-41 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Transplantation, Antigens + antibodies), (*Antigens + antibodies, Transplantation), (*Immunology, Transplantation), Gamma globulin, Immune serums, Blood circulation, Lymphocytes, Tissues (Biology), Embryos, Mammals, Electrophoresis

Fetal lambs were grafted in utero with orthotopically placed split-thickness skin homografts. At the same time the lambs, being essentially agammaglobulinemic, were given large intravascular doses of rabbit anti-sheep gamma- and beta2M-globulins, the levels of which were maintained in the fetal circulation by an appropriate interacardiac booster injection halfway through the experiment. The presence of persisting levels of these rabbit antibodies in the fetal circulation had no detectable inhibitory effect on the course of homograft rejection by the fetus. It is concluded from these data that conventional circulating antibody does not play an obligatory role in the rejection of solid tissue homografts. It is further suggested that the antibody or antibody-like activity responsible for the specificity of immunologically active lymphoid cells resides not on the surface but rather within the cell. (Author)

AD-621 277 Div. 16/1 ,16/15,30/2
CFSTI Prices: HC $2.00 MF $0.50
STANLEY COBB LABS FOR PSYCHIATRIC RESEARCH MASSACHUSETTS GENERAL HOSPITAL BOSTON

RESEARCH ON INFORMATION PROCESSING IN THE CENTRAL NERVOUS SYSTEM.
Scientific rept.,
by Frank R. Ervin. 23 Jul 65, 26p. Rept. no. SR-1
Contract AF19 628 408 Proj. 5632 Task 563208
AFCRL , 65-580

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Central nervous systems, Data processing systems), (*Cerebral cortex, Vision), Visual perception, Visual signals, Digital computers, Cathode ray tubes, Statistical analysis, Cats, Stimulation, Nerve cells

A system of automatic receptive field mapping for visual cortical neurons by a digital computer. It consists of (1) stimulus display by a digital CRT, simultaneous data sampling and on-line data processing into a post-stimulus time histogram and an averaged evoked potential, and (2) offline readout of numerical values and tabulation. Several problems lying between the neurophysiological or statistical nature of the response and data processing techniques are also described and discussed. (Author)

AD-621 278 Div. 16/15,5/1
CFSTI Prices: HC $3.00 MF $0.75
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB
INTEGRATION OF CONCURRENT VISUAL AND AUDITORY MESSAGES.
Final technical rept. for 16 Mar 64-15 Jul 65,
by Donald B. Devoe. Oct 65, 68p. Rept. no. F-4068-1
Contract AF19 628 4073 Proj. 7682 Task 768201
ESD , TR-65-461

Unclassified report

Descriptors: (*Command + control systems, Air Force), (*Auditory perception, Display systems), (*Visual perception, Display systems), (*Display systems, Human engineering), Decision making, Vision, Interference, Sensory mechanisms

Two experiments were performed involving the concurrent presentation to human subjects of two messages, one auditory and one visual, followed by a question requiring information from both messages. The results indicated that bimodally-presented information can be integrated for decision making. However, there was no evidence of an advantage to bimodal presentation as a means of unburdening an overloaded sense. The implications of the results for displays and communications in complex control centers are discussed and directions for future research are suggested. (Author)

AD-621 317 **See Fld. 6/1**

AD-621 335 Div. 16/1 ,16/3 ,16/5
CFSTI Prices: HC $1.00 MF $0.50
SCHOOL OF AEROSPACE MEDICINE BROOKS AFB TEX
HYPOTHESES CONCERNING THE REGULATION OF THE ELECTROLYTE COMPOSITION OF HUMAN PAROTID SALIVA.
Aeromedical review,
by Ira L. Shannon, and Howard H. Chauncey.
Jun 65, 16p. Rept. no. review 5-65

Unclassified report

Prepared in cooperation with Tufts Univ., Boston, Mass. School of Dental Medicine.

Descriptors: (*Saliva, Electrolytes (Physiology)), (*Electrolytes (Physiology), Secretion), Salivary glands, Biochemistry, Quantitative analysis, Sodium, Potassium, Calcium, Chlorides, Bicarbonates, Phosphates

The presentation is part of an effort to integrate observations with the findings obtained by other investigators. This integration of data resulted in the formation of several hypotheses which appear to provide an explanation of some of the mechanisms responsible for the relationship between secretion rate and composition. An attempt was made to limit the presentation to studies conducted on human subjects. The paucity of information relative to humans made it necessary to include certain animal studies. Wherever possible, these animal studies were limited to findings which appear to be germane to the function of both human and animal glands.

AD-621 338 **See Fld. 6/13**

AD-621 386 Div. 16/15,28/3
BROWN UNIV PROVIDENCE R I DEPT OF PSYCHOLOGY
EVOKED RESPONSE OF THE HUMAN VISUAL CORTEX: SPECTRAL SENSITIVITY,
by Carl R. Cavonius. 1964, 2p. Contract Nonr56221

Unclassified report

Prepared in cooperation with Eye Research Foundation, Bethesda, Md. and Human Sciences Research, Inc., McLean, Va. Pub. in Psychon. Sci. v2 p185-6 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Color vision, Cerebral cortex), (*Cerebral cortex, Color vision), Spectra (Visible + ultraviolet), Vision, Adaptation (Physiology), Retina, Stimulation, Sensitivity

Responses evoked by visual stimuli were recorded from the human scalp over the visual cortex. At low intensities response amplitude is linear with log stimulus energy. Spectral sensitivity of the cortical response resembles that of the electroretinogram elicited by similar stimuli but shows maximum sensitivity at about 560 millimicrons, indicating a largely photopic origin. (Author)

AD-621 390 **See Fld. 6/13**

AD-621 397 Div. 16/10
NAVAL MEDICAL RESEARCH UNIT NO 2 TAIPEI (TAIWAN)
LIVER DISEASE SURVEY ON TAIWAN.
Research rept.,
by S. C. Sun, W. C. Cooper, R. K. Gershon, and J. W. Fresh. 18 Jan 65, 9p.
NAVMED , MR005.09-1201.11.3

Unclassified report

Pub. in Archives Pathologique v79 p619-26 Jun 1965 (Copies available only to DDC users).

Descriptors: (*Liver, Diseases), Infectious hepatitis, Hepatitis viruses, Hepatitis (Nonviral), Histology, Pathology, Tissues (Biology), Diagnosis, Histological techniques, Taiwan

The results of a review of liver biopsy tissue from 220 Chinese jaundiced individuals on Taiwan showed that the three most common diseases were viral hepatitis, postnecrotic cirrhosis, and hepatocarcinoma. The results of transaminase tests are given for 42 apparently well individuals. Biopsy examinations were performed on 40 of these. A total of 29 of the biopsy group were selected from a population of 1,399 individuals for further study based on the results of serum transaminase tests. All those with SGPT values over 40 units had some form of liver disease. Viral hepatitis was the most common diagnosis. Hepatitis was chronic on initial study or became so during the study period (six months) in almost half of the cases. (Author)

AD-621 413 Div. 16/1
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE MARSEILLE (FRANCE)
LIGHT ENERGY CONVERSION IN NEURONAL MEMBRANES,
by N. Chalazonitis. 27 Jul 64, 34p. Contract AF EOAR114 63 ,NIH NB03337 Proj. 9777 Task 977701
AFOSR , 65-1293

Unclassified report

Pub. in Photochemistry and Photobiology v3 p539-59 1964 (Copies available only to DDC users).

Descriptors: (*Nerve cells, Photoelectric effect), (*Photoelectric effect, Nerve cells), (*Photosensitivity (Biological), Nerve cells), Light, Energy conversion, Membranes (Biology), Infrared radiation, Organic pigments, Illumination, Lipoproteins, Absorption spectrum, Photoconductivity, Photochemistry, France

Photocurrents and decrease in membrane resistance were shown by illuminating pigmented nerve cells, and vitally stained nerve fibers. Light effects on electrogenic membrane were compared to those of IR. Both radiations decrease, with different yields, the membrane resistance. However, the initiated membrane currents are generally of opposite directions. Similarly, opposite direction photocurrents are elicited by specific illuminations of 2 intracellular pigments, haemoprotein or carotenoid, in some nerve cells. From spectrographic, respirometric and oscillographic evidences, the molecular mechanisms implied in the light energy conversion into membrane photocurrent can be considered as follows: (1) Release of electrons and hydrogen ions from dyes or natural pigments in molecular association with lipoproteins; secondary reactions of e and H+ with acceptors, i.e., dyes or oxygen; (2) Secondary changes in adsorption bonds between dyes or pigments and associated lipoproteins resulting in changes in molecular orientations; and (3) Directional fluxes of e, H (+), and other ions, imitating fluxes elicited under a cathode during direct current flow. (Author)

AD-621 426 Div. 16/1
HARVARD UNIV BOSTON MASS NEUROPHYSIOLOGY LAB
RECEPTIVE FIELDS OF OPTIC NERVE FIBERS IN THE SPIDER MONKEY,
by D. H. Hubel, and T. N. Wiesel. 12 Jul 60, 9p.
Contract AF49 638 713 Grant ,PHS B2251
AFOSR , 1389

Unclassified report

Pub. in J. Physiol. v154 p572-80 1960 (Copies available only to DDC users).

Descriptors: (*Vision, Optic nerve), (*Optic nerve, Monkeys), Retina, Ganglia, Nerve cells, Nerve fibers, Nervous system, Physiology, Nerve impulses, Light, Adaptation (Physiology), Thresholds (Physiology), Color vision

Receptive fields of retinal ganglion cells were studied in the light-adapted spider monkey. All fields mapped with white light had a concentric arrangement sililar to that of the cat retinal ganglion cells, with a sharply demarcated 'on' centre surrounded by an antagonistic 'off' periphery, or the reverse. The smallest receptive field centres were found near the fovea, and the size of centres tended to increase with increasing distance from the fovea. The smallest centre had a diameter of 4 minutes of arc (corresponding to about 20 microns on the retina) and was located 4 degrees from the fovea; the largest centre had a diameter of 2 degrees. Three ganglion cells out of about 100 responded in a specific way to coloured stimuli. In these cells light of short wave-length produced an 'on' response and light of long wave-length evoked inhibition followed by an 'off' response. Transition between the two types of response occurred at about 500 millimicrons, light of this wave-length evoked only feebel 'off' responses. Very weak responses were obtained to white light, presumably owing to the antagonism between light of short and long wavelengths. (Author)

AD-621 433 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
PILOT FATIGUE: INTERCONTINENTAL JET FLIGHT. 1. OKLAHOMA CITY TO TOKYO TO OKLAHOMA CITY,
by George T. Hauty, and Thomas Adams. Mar 65, 24p.
AM , 65-16

Unclassified report

Descriptors: (*Pilots, Fatigue (Physiology)), (*Fatigue (Physiology), Pilots), Medical examination, Reaction (Psychology), Reflexes, Body temperature, Thresholds (Physiology), Decision making, Aviation medicine, Jet planes, Physiology, Graphics

Following 3 consecutive days of biomedical assessment in Oklahoma City, six healthy subjects were transported to Tokyo, where assessments were made on alternate days throughout a period of 10 days, and were then transported back to Oklahoma City, where assessments were made for 3 consecutive days. Based upon the single parameter of rectal temperatures, the mean values of all subjects revealed that biological time had apparently shifted from Oklahoma City to Tokyo time within 3 days and from Tokyo back to Oklahoma City time within 1 day. Individual rectal temperature curves of the different subjects, however, revealed a profound range of individual differences. The mean proficiency with which the subjects executed basic task functions was adversely affected to a substantial extent during the first day in Tokyo and, to a lesser extent, the first day of return to Oklahoma City. (Author)

AD-621 434 **See Fld. 1/2**

AD-621 435 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
CIVIL AEROMEDICAL RESEARCH INST OKLAHOMA CITY OKLA
ADAPTATION TO VESTIBULAR DISORIENTATION. II. NYSTAGMUS AND VERTIGO FOLLOWING HIGHVELOCITY ANGULAR ACCELERATIONS,
by William E. Collins. Sep 65, 12p.
AM , 65-24

Unclassified report

Descriptors: (*Vestibular apparatus, Adaptation (Physiology)), Vertigo, Acceleration, Velocity, Spin, Rotation, Eye, Motion, Vision, Semicircular canals, Stimulation, Telemeter systems

Professional figure skaters who, as part of their daily routine, subject themselves to high levels of disorientation-and vertigo-producing stimuli, were given a series of laboratory tests consisting primarily of caloric irrigations and mild angular accelerations. Electronystamographic recordings and subjective reports (turning sensations and vertigo) were obtained. Contrary to other reports, brisk vestibular responses were obtained, prompting an 'on-ice' study employing telemetry of eye movements to an ENG recorder and motion pictures. Data were obtained during and following normal high-velocity spins on ice. In the absence of opportunities for visual fixation, vigorous nystagmus and disorientation occurred. Thus, even with highly trained subjects, vestibular stimulation can produce disorientation when visual cues are not present. (Author)

AD-621 437 Div. 16/1 ,16/12
HARVARD UNIV BOSTON MASS NEUROPHYSIOLOGY LAB
INTEGRATIVE ACTION IN THE CAT'S LATERAL GENICULATE BODY,
by D. H. Hubel, and T. N. Wiesel. 3 Oct 60, 15p. Contract AF49 638 713 ,Grant PHS B2260
AFOSR , 1982

Unclassified report

Pub. in J. Physiol v155 p385-98 1961 (Copies available only to DDC users).

Descriptors: (*Vision, Optic nerve), (*Optic nerve, Nerve impulses), Light, Adaptation (Physiology), Eye, Nerve fibers, Nerve cells, Retina, Ganglia, Stimulation, Nervous system, Physiology, Histology, Cats

Cells were recorded with tungsten electrodes in the dorsal lateral geniculate body of the cat. Receptive fields of these units were mapped out, in the light-adapted state, with small sports of light. In their general arrangement geniculate receptive fields resembled those of retinal ganglion cells, having an excitatory ('on') centre and inhibitory ('off') preriphery, or reverse. The two portions of a receptive field were mutually antagonistic; the decrease in centre responses cauded by inclusion of peripheral portions of receptive fields was termed peripheral suppression. Cells recorded in layers A and B of the lateral geniculate body were driven from the contralateral eye; cells in layer A1 from the ipsilateral eye. In penetrations normal to the layers receptive fields of cells in a single layer were close together or superimposed, and from one layer to the next occupied exactly homologous positions in the two retinas. Binocular interaction was not observed in any of the cells studied. All three layers of the lateral geniculate contained both 'on'-centre and 'off'-centre units. Cells in layers A and A1 were similar both in their firing patterns and in average receptive field size. Cells in layer B were more sluggish in their responses to light stimuli, and tended to have larger receptive field centres. Cells with receptive fields within or near the area centralis tended to have smaller field centres and stronger suppression by the receptive field periphery than cells with their fields situated in more peripheral regions of the retina.

AD-621 458 Div. 16/1
JOHNS HOPKINS UNIV BALTIMORE MD SCHOOL OF MEDICINE
MECHANISM OF HAEMOLYSIS BY COMPLEMENT,
by Manfred M. Mayer. 1965, 30p. Contract Nonr24860 Grant ,NSF G6476

Unclassified report

Pub. in Ciba Foundation Symposium on Complement p4-32 1965 (Copies available only to DDC users).

Descriptors: (*Hemolysis, Immunology), (*Complement, Hemolysis), (*Immunology, Complement), Erythrocytes, Antigens + antibodies, Blood serum, Enzymes, Cells (Biology), Immune serums, Gamma globulin, Antigen-antibody reactions, Guinea pigs, Humans, Mammals

Recent studies of immune haemolysis have been concerned with isolation and characterization of intermediates, investigation of the successive steps, development of the one-hit theory, design of precise analytical methods for measurement of C'1, C'2 and C'4, and elucidation of the enzymic action of C'1a. What was formerly known as C'3 has been resolved into five distinct factors but knowledge of the intermediate steps in this phase of the system is still sketchy. While the mechanism of cytocidal action is still unsolved, many new tools are now available for studying the nature of complement as well as its participation in immune defence, hypersensitivity reactions, autoimmune phenomena and graft rejection. (Author)

AD-621 460 Div. 16/1
OXFORD UNIV (ENGLAND)
SEX HORMONES, BRAIN DEVELOPMENT AND BRAIN FUNCTION,
by Geoffrey W. Harris. 1964, 23p. Contract AF EOAR3 64
AFOSR , 65-1295

Unclassified report

Pub. in Endocrinology v75 n4 p627-48 Oct 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sex hormones, Central nervous system), (*Brain, Sex hormones), Reproductive system, Sex glands, Pituitary gland, Reproduction (Physiology), Rhythm (Biology), Thalamus, Testes, Ovaries, Progesterone, Estrogens, Testosterone, Growth, Males, Females, Rats, Great Britain

The view that gonadal hormones exert a double action on the central nervous system--inductive during development and excitatory in the adult--allows a direct comparison between the brain and genital tract as target organs for these hormones. In both cases it is generally the male hormone which is dominant in the inductive action in amphibians and mammals. The presence of testis hormone induces, in both genetic males and females, the development of a male genital tract and male type brain. The absence of testis hormone (in the normal female or after gonadectomy in both sexes) allows the development of a female genital tract and a female type brain. Since the inductive influence of the male hormone in the rat appears to be exerted on the genital tract at an earlier stage of development than on the brain, it is possible by experimental procedures (castration of the male at birth, or administration of testosterone to the neonatal female) to obtain a normally organized genital tract in the presence of deviated development of the brain.

AD-621 478 **See Fld. 5/10**

AD-621 495 Div. 16/10
ARMED FORCES INST OF PATHOLOGY WASHINGTON D C
TUMORS OF THE UMBILICUS,
by Willard D. Steck, and Elson B. Helwig. 15 Sep 64, 9p.

Unclassified report

Pub. in Cancer v18 n7 p907-15 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Neoplasms, Abdomen), (*Cancer, Abdomen), Pathology, Tissues (Biology), Histological techniques, Medical examination, Diagnosis

Studied were 112 umbilical tumors. Of these, 48 were malignant and 64 were benign. Eight tumors were primary malignancies and 40 metastasized to the umbilicus from the stomach, pancreas, intestine, ovaries and other organs. The metastatic lesions in the umbilicus offered the first evidence of malignancy in 18 patients and were present prior to the diagnosis of internal cancer in 29. A group of 64 benign tumors included a variety of pigmented nevi, fibroepithelial papillomas, pyogenic granulomas and other less common lesions that were removed either for assistance in diagnosis or because of chronic inflammation. (Author)

AD-621 500 Div. 16/10,16/12,28/3
CFSTI Prices: HC $1.00 MF $0.50
NAVY MEDICAL NEUROPSYCHIATRIC RESEARCH UNIT SAN DIEGO CALIF
PHYSIOLOGICAL RESPONSE PATTERNS IN CARDIAC PATIENTS,
by David J. Hord, Laverne C. Johnson, and Duane M. Rumbaugh. Jun 65, 16p. Rept. no. 64-10
Task MR005 12 2304

Unclassified report

Descriptors: (*Cardiovascular diseases, Etiology), Heart, Diseases, Electroencephalography, Galvanic skin response, Pulse rate, Body temperature, Skin, Hypertension, Atherosclerosis, Rheumatic diseases, Emotions, Reaction (Psychology), Personality, Psychology, Pathology, Medical examination

EEG amplitude, alpha index, skin conductance, GSR spontaneity, heart rate, respiration rate, and skin temperature were compared among groups of hospitalized hypertensive, arteriosclerotic and rheumatic heart disease patients. There were no significant differences among the groups when the patient's age was used as a covariate. Autonomic responses to neutral and emotional stimuli also failed to differentiate the three groups when the prestimulus level was used as a covariate. Habitua-

tion curves for GSR, heart rate, respiration rate and skin temperature were not significantly different among the groups. A test of the 'law of initial value' indicated that skin conductance changes in the hypertensive group did not show the positive regression line slope that typifies nonclinical groups. The results are generally consistent with the growing body of data which indicate that psychosomatic disorders are characterized by a large degree of automonic response specificity. The validity of a concept of general sympathetic hyperactivity in hypertensive disorders seems highly doubtful. (Author)

AD-621 508 See Fld. 6/15

AD-621 528 See Fld. 6/15

AD-621 529 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
ARMY CHEMICAL RESEARCH AND DEVELOPMENT LABS EDGEWOOD ARSENAL MD
EFFECT OF PREVIOUS POSTURE ON CARDIAC ACCELERATION AT THE BEGINNING OF EXERCISE.
Technical rept.,
by F. N. Craig. Mar 65, 11p. Rept. no. CRLDR-3268
Task 10522301A07901

Unclassified report

Descriptors: (*Heart, Exercise), Acceleration, Pulse rate, Posture, Blood circulation, Thorax, Legs, Temperature, Stress (Physiology)

Three subjects rested in the supine position, arose quickly, and ran for 1 min on a treadmill. Then they stood erect for 1 min and ran again. For the first 30 beats at the beginning of the run, their cardiac acceleration was greater after supine than after standing rest. The acceleration after supine rest then declined. The difference in cardiac rate arising from previous posture was insignificant for the last 30 sec of the run. Environmental temperatures were 18 degrees and 46 degrees C. The initial difference in acceleration was greater at the higher temperature. The distribution of blood between the chest and the periphery contributes to the differences in the degree of acceleration of the heart at the beginning of exercise. (Author)

AD-621 537 Div. 16/10
CALIFORNIA UNIV LOS ANGELES SCHOOL OF MEDICINE
THE EFFECT OF MEGAVOLTAGE TOTAL BODY IRRADIATION ON EXPERIMENTAL BLADDER CALCULOGENESIS,
by A. T. K. Cockett, R. M. Nakamura, A. G. Fingerhut, and R. T. Kado. 21 Dec 64, 4p. Contract AF AFOSR246 63

Unclassified report

Pub. in Investigative Urology v3 n1 p33-5 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Urinary system, Radiation effects), (*Whole body irradiation, Urinary system), (*Radiation effects, Urinary system), Linear accelerators, Phosphorus, Calcium, Blood chemistry, Radiological dosage, Bone, Kidneys, Gastrointestinal system, Rats

The question of whether 300 rad (whole body dose) delivered by a 6-Mev linear accelerator would continue to result in the finding of a smaller bladder calculus was tested in male rats. The magnesium disc technique was again employed. Smaller bladder calculi were found at 300 rad but not at 150 and 450 rad. The possible explanations are discussed. Serum phosphorus was reduced only in the 300-rad group. (Author)

AD-621 543 Div. 16/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
FOCAL ANTIBODY PRODUCTION BY TRANSFERRED SPLEEN CELLS IN IRRADIATED MICE,
by John H. L. Playfair, Ben W. Papermaster, and Leonard J. Cole. 20 Aug 65, 18p. Rept. no. USNRDL-TR-887
Task MR005 08 1200

Unclassified report

Descriptors: (*Antigens + antibodies, Production), (*Immunology, Antigen-antibody reactions), Spleen, Cells (Biology), X rays, Mice, Lethal dosage, Erythrocytes, Mammals, Hemolysis, Transplantation, Radiobiology

Lethally irradiated mice were injected with various numbers of normal spleen cells, and then immunized with sheep erythrocytes. In their spleens, antibody appeared in localized areas whose number corresponded to the number of spleen cells injected. When sheep and pig erythrocytes were injected simultaneously, antibody against each was found in separate areas. From these findings it is postulated that single precursor cells are responsible for the areas of antibody, and that the progeny of each is restricted to forming a single antibody. (Author)

AD-621 599 Div. 16/1 ,16/12
GENOA UNIV (ITALY) CLINICA NEUROCHIRURGICA
AN EXPERIMENTAL STUDY OF THE CORTICAL REACTIVITY DURING SLEEP AND WAKEFULNESS,
by G. F. Rossi, M. Palestini, M. Pisano, and G. Rosadini. 1963, 25p. Contract AF EOAR62 106

AFOSR , 65-1291

Unclassified report

Pub. in Aspects Anatomo-Fonctionnels de la Physiologie du Sommeil, Paris, 1965 p509-32 (Copies available only to DDC users). Proceedings of International Conference held at Lyon, France, 9-11 Sep 63.

Descriptors: (*Sleep, Cerebral cortex), (*Cerebral cortex, Sleep), Brain, Thalamus, Stimulation, Electroencephalography, Nerve cells, Nervous system, Cats, Physiology, Symposia, Italy

In intact cats with chronically implanted electrodes, electrical potentials have been evoked in the visual cortex by single stimuli of the optic radiations and of the lateral geniculate body, and in the sensory-motor cortex by simulation of the pyramidal tract and of the VPL thalamic nucleus. A comparison has been made between the mean amplitude of the responses recorded during wakefulness, light sleep (slow, high amplitude EEG activity) and deep sleep (low voltage, fast EEG activity and EMG flattening). The amplitude of the cortical responses evoked by the optic radiations or antidromically by the pyramidal tract is larger during deep sleep than during wakefulness in the great majority of cases; no significant difference is found between the responses recorded during light sleep and deep sleep. The recovery cycle of the visual cortex is more rapid during sleep than during wakefulness in most of the cases; it is similar in the two phases of sleep. The amplitude of the cortical responses to thalamic stimulation is larger during deep sleep than during wakefulness in all the cases; it is, however, relatively small during light sleep. The results indicate that the reactivity of the cortical neurons is enhanced during both light sleep and deep sleep. Thalamic reactivity is also larger during deep sleep than during wakefulness, but is depressed during light sleep. (Author)

AD-621 607 See Fld. 6/1

6/17. PROTECTIVE EQUIPMENT

AD-621 275 Div. 29/6
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
OPERATIONAL ENVELOPES FOR CONSERVATIVE ASTRONAUT RETRIEVAL BY TETHERLINE.
Master's thesis,
by Thomas Robert Lange. Aug 65, 80p. Rept. no. GA/PH/65-8

Unclassified report

Descriptors: (*Astronauts, Mooring), (*Safety devices, Astronauts), Space environmental conditions, Recovery, Spacecraft, Orbital trajectories, Programming (Computers), Mementum, Optimization

The purpose of the study was to determine in general the conditions for which an astronaut could be recovered to a spacecraft in a circular orbit of 107.56 miles using a tetherline. Simultaneous differential equations were solved with a digital computer for a large number of recovery trajectories varying initial conditions and recovery parameters. Two types of tethering systems were examined. It was found that if the astronaut was initially at rest he could be safely recovered from up to 130 ft away, but that if he had certain initial transverse velocities the safe operating radius was reduced drastically. (Author)

7/1. CHEMICAL ENGINEERING

AD-621 524 See Fld. 20/4

AD-621 587 Div. 4/1 ,25/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE ELECTRICAL RESISTANCE OF FLUIDIZED BEDS OF COKE AND GRAPHITE,
by W. Graham, and E. A. Harvey. 14 Aug 64, 5p. Rept. no. NRC-8485

Unclassified report

Pub. in The Canadian Journal of Chemical Engineering v43 p146-9 Jun 1965 (Copies available only to DDC users.)

Descriptors: (*Coal, Resistance (Electrical)), (*Graphite, Resistance (Electrical)), Canada, Bubbles, Particles, Electric currents, Gases

The electrical resistance of beds of finely divided graphite and conducting coke was investigated in the settled and fluidized regions. In almost all cases a maximum in the bed resistance occurs at a gas velocity slightly greater than that required for minimum fluidizing. This was explained qualitatively by assuming current flow along a continuous network of touching particles the resistance of which is modified by the growth of gas bubbles in the bed. (Author)

7/2. INORGANIC CHEMISTRY

AD-620 813 Div. 4/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PRODUCTION OF BINARY LANTHANUM AND SODIUM BORIDE AND THE STUDY OF CERTAIN PHYSICAL AND CHEMICAL PROPERTIES,
by G. V. Samsonov, V. A. Obolonchik, Yu. B. Paderno, R. V. Serbina, and V. S. Fomenko. 9 Aug 65, 16p. Rept. no. FTD-TT-65-952
TT , 65-63856

Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Khimii (USSR) v37 n9 p1872-8 1964.

Descriptors: (*Lanthanum compounds, Borides), (*Sodium compounds, Borides), (*Borides, Synthesis (Chemistry)), Electrolysis, Crystal structure, Crystal lattices, Work functions, X-ray diffraction analysis, Solubility, USSR

It is shown that the crystalline structure of the melted media of the binary boride (LaNa)B6 obtained by electrolysis corresponds to the type CaB6, the periods of the crystalline lattice increasing with an increase in sodium content. (Author)

AD-620 901 See Fld. 20/2

AD-620 942 Div. 4/2 ,25/7
METCALF CHEMICAL LABS BROWN UNIV PROVIDENCE R I
VIBRATIONAL RELAXATION OF HI, 1400-2300K,
by C. C. Chow, and E. F. Greene. 23 Mar 65, 9p. Contract DA31 124ARO D163
AROD , 4676:2

Unclassified report

Pub. in Journal of Chemical Physics v43 n2 p324-32 Jul 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrogen compounds, Iodides), (*Iodides, Relaxation time), Chemical equilibrium, Chemical bonds, Vibration, Shock waves, Heating, Atomic energy levels, Reaction kinetics

The vibrational relaxation of HI in a mixture of 10% HI in Ar was studied by following the populations of the four lowest vibrational states as they approach their equilibrium values after the abrupt heating produced by a shock wave. The states v=1, 2, and 3 all relax approximately exponentially with the same rate constant. As the temperature increases from 1400K to 2300K, k1 approximately triples. This temperature dependence is very much smaller and the rate is very much faster than the values predicted on the basis of the Schwartz-Slawsky-Herzfeld theory or the empirical correlation of Millikan and White. (Author)

AD-620 991 Div. 4/2 ,4/4 ,25/7
VANDERBILT UNIV NASHVILLE TENN
ELECTRONIC SPECTRA OF THE GA2, IN2, AND TL2 MOLECULES,
by Dorothy S. Ginter, Marshall L. Ginter, and K. Keith Innes. 1 Feb 65, 4p.
AROD , 4283:6

Unclassified report

Pub. in The Journal of Physical Chemistry v69 n7 p2480-3 July 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gallium, Band spectrum), (*Indium, Band spectrum), (*Thallium, Band spectrum), Diatomic molecules, Continuous spectrum, Frequency, Selection rules, Atomic orbitals, Absorption spectrum

It is argued that most bands listed in this note are emitted by the homonuclear diatomic molecules Ga2, In2, and Tl2. The longest wave length, red-degraded bands are for each molecule the source of the least ambiguous vibrational analysis. Apparent dissimilarities in the series at the shorter wave lengths may arise from the expected differences in coupling of motions and in selection rules between lighter and heavier members of the series. For the lighter members of the series, electron configurations should be analogous to those discussed already for Al2. (Author)

AD-621 029 Div. 4/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
INTERCALATION OF THE RARE EARTH ELEMENTS INTO GRAPHITE AND DICHALCOGENIDES.
Master's thesis,
by William Ernest Craven. Aug 65, 74p. Rept. no. GNE/PH/65-02

Unclassified report

Descriptors: (*Graphite, Complex compounds), (*Rare earth compounds, Complex compounds), (*Chalcogens, Complex compounds), (*Complex compounds, Synthesis (Chemistry)), Cerium compounds, Samarium compounds, Gadolinium compounds, Terbium compounds, Dysprosium compounds, Holmium compounds, Erbium compounds, Thulium compounds, Ytterbium compounds, Tungsten compounds, Molybdenum compounds, Sulfides, Selenides, X-ray diffraction analysis, Magnetic properties, Valence, Superconductors

The graphite intercalation compounds of cerium, samarium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, and ytterbium were prepared by reacting powdered graphite with the solution of the metal in liquid ammonia. Electrolysis was necessary to dissolve all but ytterbium. Intercalation compounds of ytterbium and samarium with the dichalcogenides: WS2, WSe2, and MoS2, were prepared by the same process. The X-ray diffraction patterns showed that mixtures of several stages were present in the graphite compounds. Magnetic susceptibility measurements indicated that most of the rare earths intercalate in the trivalent state, the exception being divalent samarium. Apparently ytterbium exists in both divalent and trivalent states in the compound. (Author)

AD-621 236 See Fld. 7/4

AD-621 267 Div. 4/2 ,4/4
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
ON EQUILIBRIA IN POLYMOLYBDATE SOLUTIONS,
by Yukiyoshi Sasaki, and Lars Gunnar Sillen. 30 Apr 64, 3p. Contract AF EOAR8 63
AFOSR , 65-1248

Unclassified report

Pub. in Acta Chemica Scandinavica v18 p1014 1964 (Copies available only to DDC users).

Descriptors: (*Molybdates, Chemical equilibrium), (*Chemical equilibrium, Molecular association), Complex compounds, Ions, Solutions, Programming (Computers), Sweden

Preliminary results are reported for studies of the equilibra in polymolybdate solutions using the LETAC-ROP computer program.

AD-621 282 Div. 4/2 ,4/4
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
ON THE HYDROLYSIS OF NIOBATES IN 3M K (CL) MEDIUM,
by Georg Neumann. 13 Jan 64, 3p. Contract AF61 052 162 Grant ,AF EOAR8 63
AFOSR , 65-1244

Unclassified report

Pub. in Acta Chemica Scandinavica v18 n1 p278-80 1964 (Copies available only to DDC users).

Descriptors: (*Niobates, Hydrolysis), (*Hydrolysis, Molecular association), Valence, Chemical equilibrium, Voltage, Volumetric analysis, Solutions, Potassium compounds, Chlorides, Ions, Sweden

The primary object of the work was to decide whether hexa- or pentaniobates predominate in solution. A series of emf-titrations were carried out in which the total niobium concentration, B, was kept constant whereas the total OH (-)-concentration in excess over Nb (OH)5, --H, was varied. The variation of the activity factors was minimized by adding KCl to the solutions and keeping (K (+)) = 3 M. (OH (-)) was obtained from the emf of the cell --Pt, H2 (1 atm)/ niobate solution S/SE + where SE is the reference electrode. From B, --H and (OH (-)) the average negative charge per Nb atom was obtained as Z = (--H--(OH (-)))/B. (Extracted)

AD-621 283 Div. 4/2 ,4/4
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
STUDIES ON THE HYDROLYSIS OF METAL IONS. PART 49. AN EMF STUDY OF LITHIUM HYDROXIDE IN 3 M (NACLO4) MEDIUM,
by Hitoshi Ohtaki. 19 Nov 63, 13p. Contract AF EOAR8 63 Proj. 9710 Task 971001
AFOSR , 65-1245

Unclassified report

Pub. in Acta Chemica Scandinavica v18 n2 p521-33 1964 (Copies available only to DDC users).

Descriptors: (*Lithium, Hydrolysis), (*Hydrolysis, Electrochemistry), Lithium compounds, Hydroxides, Voltage, Sodium compounds, Perchlorates, Chemical equilibrium, Ions, Solutions, Sweden

An emf study was made in a system of various concentrations of lithium and hydroxide ions in sodium perchlorate medium using a hydrogen electrode at 25C. The general composition of the cell is Pt/H2, B M Li (+), (3-B) M Na (+), A M OH (-), (3-A) M ClO4 (-)/Ref where Ref =/3 M NaClO4/ 2.99 M Na (+), 0.01 M Ag (+), 3 M ClO4 (-)/AgCl,Ag. From the difference in emfs between sodium hydroxide solutions with and without lithium ions, the following formation constant of lithium hydroxide was estimated: Li (+) + OH (-) reversibly yields LiOH, K = 0.66 = 0.02 (log K = -0.18 = 0.01). (Author)

AD-621 316 See Fld. 7/3

AD-621 346 Div. 4/2 ,25/7
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
ARE AQUEOUS METAVANADATE SPECIES TRINUCLEAR, TETRANUCLEAR, OR BOTH. PRELIMINARY LETAGROP RECALCULATION OF EMF DATA,
by Felipe Brito, Nils Ingri, and Lars Gunnar Sillen. 13 Jul 64, 3p. Contract AF EOAR8 63 Proj. 9710 Task 971001
AFOSR , 65-1246

Unclassified report

Pub. in Acta Chemica Scandinavia v18 n6 p1557-8 1964 (Copies available only to DDC users).

Descriptors: (*Vanadates, Molecular association), Voltage, Atomic properties, Complex compounds, Chemical equilibrium, Solutions, Programming (Computers), Sweden

Emf measurements on metavanadate solutions at 15C in alkaline 0.5 M Na (Cl) medium were recalculated by means of the computer program, LETAGROP. The results obtained indicate that both trinuclear and tetranuclear species are present in the metavanadate solutions. (Author)

AD-621 382 See Fld. 11/6

AD-621 461 See Fld. 20/2

AD-621 462 Div. 4/2 ,25/7
STERLING CHEMISTRY LAB YALE UNIV NEW HAVEN CONN
ABSORPTION SPECTRUM OF GASEOUS F (-) AND ELECTRON AFFINITIES OF THE HALOGEN ATOMS,
by R. Stephen Berry, and Curt W. Reimann. 30 Nov 62, 6p. Contract AF AFOSR183 63 Proj. 9760 Task 976002
AFOSR , 65-1253

Unclassified report

Pub. in Journal of Chemical Physics v38 n7 p1540-3 Apr 1 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Fluorides, Absorption spectrum), (*Halogens, Atomic properties), Cesi-

um compounds, Rubidium compounds, Potassium compounds, Vapors, Continuous spectrum, Electrons, Photochemistry, Chlorine, Bromine, Iodine, Fluorine

The absorption spectrum of gaseous fluoride ion has been observed in shock-heated vapors of CsF, RbF, and KF. The spectrum is a continuum with two sharp thresholds at 3595 and 3542 A, similar to those of the other halide ions. The electron affinity determined from the low-energy threshold is 3.448=0.005 eV. The crosssection for photodetachment at 3565 A is about 2.5=2X10 to the -18 sq cm and at 3525, about 3.3=2X10 to the -18 sq cm. The electron affinities of chlorine, bromine and iodine are revised, respectively, to 3.613, 3.363, and 3.063 eV, all with uncertainties of 0.003 eV. (Author)

7/3. ORGANIC CHEMISTRY

AD-620 815 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF OBTAINING ALKYL AND ARYL CHLOROSILANES,
by K. A. Andrianov, and S. A. Golubtsov. 13 Aug 65, 7p. Rept. no. FTD-TT-65-640
TT , 65-63858

Unclassified report

Unedited rough draft trans. of Russian patent 166 025, pub. 19 May 53, appl. 466319/23-4, 2p.

Descriptors: (*Silanes, Synthesis (Chemistry)), (*Chlorine compounds, Silanes), Copper compounds, Halogenated hydrocarbons, Particle size, Patents, USSR

The object of the invention is a method of obtaining alkyland aryl-silane-chlorides (chlorosilanes) by means of the reaction of a silico-cupric contact mass with alkyl and aryl chlorides with intermingling (stirring) which has the distinguishing feature that, for the purpose of improving the productivity and the yield of the end product, the mass is intermingled by the passing through it of a stream of alkyl and aryl chlorides with a speed of 1 to 20 cm/sec and the process takes place in a bubbling layer. The contact mass is pulverized to particles of the dimension of 0.02 to 0.25 mm. (Author)

AD-620 832 **See Fld. 6/15**

AD-620 843 Div. 4/3 ,4/4 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
SPECTRA OF ANIONS: ACETYLACETONATES,
by Carl A. Pitha. 1965, 35p.

Unclassified report

Descriptors: (*Ions, Absorption spectrum), (*Ultraviolet spectroscopy, Ions), Rare earth compounds, Salts, Solvents, Polarization, Hydrates, Atomic orbitals, Valence, Magnetic properties, Molecular properties

An investigation was undertaken to establish whether the electronic states of an anion are influenced by an associated metal ion, and if they are, under what conditions. An investigation of the ultraviolet absorption spectra of more than 40 metal acetylacetonates in iso-octane solution reveals that only certain metal ions influence the electronic states of metal acetylacetonates, and that the critical characteristic of the metal ion is its polarizing ability as reflected in Z/r. Water as a solvent, contaminant, or component of the acetylacetonate, as in hydrates, destroys this interaction. Other metal ion characteristics which appear as significant variables are the presence or absence of d-orbital electrons, valence, magnetic state, and the molecular geometry. The perturbing influence of 'reactive' solvents, such as the alcohols, is sufficiently great to obliterate most, if not all relationships. (Author)

AD-620 878 Div. 4/3 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
MARE ISLAND NAVAL SHIPYARD VALLEJO CALIF INDUSTRIAL LAB
STABILIZATION OF MONOETHANOLAMINE WITH CHELATING AGENTS,
by W. W. Johnson, R. E. McElwain, and M. Lew. 12 Apr 60, 23p. Rept. no. RDR-7116-59
Proj. S F013 11 05

Unclassified report

Descriptors: (*Amines, Stabilization), (*Complex compounds, Amines), Antioxidants, Sodium compounds, Amino acids, Alcohols, Adsorption, Carbon dioxide

It has been determined that commercial chelating agents impart oxidation resistance to carbonated monoethanolamine solutions. The monosodium salt of N, N-dihydroxyethylglycine was found to be the most effective chelating agent investigated. It reduces the oxidation rate of monoethanolamine to five percent of that which would occur if no chelating material were present.

AD-620 938 **See Fld. 20/12**

AD-620 972 **See Fld. 11/9**

AD-620 999 Div. 4/3 ,4/4 ,14/8 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
POLYMERS WITH CONJUGATION SYSTEM. PART 50. SYNTHESIS AND INVESTIGATION OF ELECTROPHYSICAL PROPERTIES OF PHTHALOCYANINE POLYMERS (POLYMERIC PHTHALOCYANINES),
by A. A. Berlin, and L. G. Cherkashina. 18 Jun 65, 12p. Rept. no. FTD-TT-65-303
TT , 65-63924

Unclassified report

Unedited rough draft trans. of Vysokomolekulyarnye Soedineniya (USSR) v6 n5 p832-7 1964.

Descriptors: (*Semiconductors, Organic compounds), (*Phthalocyanines, Polymers), (*Complex compounds, Phthalocyanines), (*Polymers, Semiconductors), Organic nitrogen compounds, Copper compounds, Electrical properties, Molecular structure, Electrical conductance, Copolymerization, Nitriles, Hydrolysis, USSR

The report is devoted to the synthesis and study of polymeric phthalocyanines formed as the result of the polycoordination of 1, 2, 4, 5-tetracyanobenzene and its mixtures with phthalonitrile by interaction with powdered copper or its monochloride (Cu2Cl2). The synthesis was carried out with the objective of elucidating the effect of the oxygen-containing groups and the branching of the molecular structure on the electrophysical properties of the polymers. It was shown that polymers synthesized from tetracyanobenzene possess and electroconductivity at 300K of 0.00001 . 100/ohm/cm at E = 6 kcal/mole as compared with the polyphthalocyanines from pyromelitic acid with a conductivity of 0.0001/ohm at E = 4.2 kcal/mole. The electroconductivity of tetracyanobenzene-phthalonitrile copolymers treated with H2SO4, accompanied by hydrolysis of the nitrile groups, is 0.00001 and 10 to the -2.6 power/ohm/cm for reprecipitated and non-reprecipitated specimens, respectively. A study of the thermostability of the synthesized polyphthalocyanines showed that specimens of the polymer which during treatment underwent hydrolysis of the nitrile groups, break down in air as a rule at higher temperature than the nitrile-containing analogs. (Author)

AD-621 010 Div. 4/3 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SEPARATION OF TAGGED COMPOUNDS BY THE METHOD OF GASEOUS CHROMATOGRAPHY,
by S. A. Volkov, and K. I. Sakodynskii. 26 Aug 65, 7p. Rept. no. FTD-TT-65-736
TT , 65-63935

Unclassified report

Unedited rough draft trans. of Atomnaya Energiya (USSR) v17 n1 p70-1 1964.

Descriptors: (*Labeled substances, Chromatographic analysis), (*Chromatographic analysis, Labeled substances), (*Silanes, Separation), Deuterium, Gases, USSR

Trimethylethoxysilane and dimethylethoxysilane that had been tagged with deuterium were separated by preparative gaseous chromatography. The basis part of the chromatograph was a column of 2-meter steel tubes with 30-mm diameter, connected by U-shaped passages, so that the column was 7 meters long in all. The samples were vaporized and fed by a nitrogen gas carrier stream into the column where they were subdivided into their components. The divided fractions were directed, with the aid of a sampling device of 7 electromagnetic valves, into proper traps where they were frozen out by liquid nitrogen. At a working temperature of the column of about 100C, mixtures of compounds with boiling points up to 160-170 C could be separated.

AD-621 015 **See Fld. 7/4**

AD-621 022 Div. 4/3
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
RADIOLYSIS OF SOLID ETHYL IODIDE.
Master's thesis,
by Gordon L. Hermann. Aug 65, 71p. Rept. no. GNE/PH/65-9

Unclassified report

Descriptors: (*Radiation chemistry, Halogenated hydrocarbons), (*Halogenated hydrocarbons, Degradation), (*Iodides, Radiation chemistry), Nuclear magnetic resonance, Line spectrum, Free radicals, Crystal lattices, Mass spectrum, Phase studies, Dissociation, Molecular association

A study of the interaction of cobalt-60 radiation with frozen ethyl iodide in both the glass and polycrystalline states. The final reaction products of the radiolysis were measured and compared with the intermediate reaction species that were observed with an electron spin resonance spectrometer. (Author)

AD-621 032 **See Fld. 11/9**

AD-621 131 Div. 4/3
CFSTI Prices: HC $3.00 MF $0.75
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
A GENERAL STUDY OF THE PROPERTIES OF SILYL RADICALS.
Final rept.,
by Grant Urry. 10 Jun 65, 81p. Contract AF AFOSR225 63 Proj. 9710 Task 971002
AFOSR , 65-1442

Unclassified report

Descriptors: (*Boron compounds, Free radicals), (*Silicon compounds, Free radicals), (*Free radicals, Chemical properties), Complex compounds, N-heterocyclic compounds, Stabilization, Silanes, Condensation reactions, Electric arcs, Chlorine compounds, Synthesis (Chemistry), Microwave spectroscopy, Organoboranes, Pyridines

The following papers, plus a list of personnel and publications, comprise the report: Some stable monoboron free radicals - 2,2'-bipyridine stabilization of unusual oxidation states of boron, by Mark A. Kuck and Grant Urray; Mercury arc induced condensations of methylchlorosilanes, by John Elbert Hanson and Grant Urry; The preparation and

properties of bis (8-quinolinolato)silicon IV dichloride and bis (salicylaldehydeato) dichlorosilicon IV, by M. M. Millard and Grant Urry; Probing with ESR, (reprinted from Horizon, vol. 11, no. 1, p. 3-4, 1964); Chelation may stabilize boron compounds, (reprinted from Chemical and Engineering Neus, 12 Apr 1965, p. 48).

AD-621 212 Div. 4/3 ,4/4
DUKE UNIV DURHAM N C DEPT OF CHEMISTRY
KINETIC VERSUS THERMODYNAMIC CONTROL IN CARBONYL ADDITION REACTIONS OF CARBANIONS,
by E. M. Kaiser, and C. R. Hauser. 15 Jun 65, 3p.
AROD , 3581:11

Unclassified report

Pub. in Chemistry and Industry p1299-300 Jul 17 1965 (Copies available only to DDC users).

Descriptors: (*Amides, Chemical reactions), (*Ketones, Chemical reactions), (*Reaction kinetics, Thermochemistry), (*Thermochemistry, Reaction kinetics), Chemical equilibrium, Control, Sodium compounds

AD-621 222 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
SULFENIC ACIDS AND THEIR DERIVATIVES. XLI. SULFENYL NITRATES AND SULFINYL RADICALS,
by Richard M. Topping, and Norman Kharasch.
1965, 7p. Contract AF49 638 718
AFOSR , 267

Unclassified report

Descriptors: (*Organic sulfur compounds, Synthesis (Chemistry)), Nitrates, Chemical properties, Sulfonates, Chlorine compounds, Nitrobenzenes, Decomposition

Sulfenyl nitrates, RSONO2, represent a novel class of sulfenyl compounds. The preparation of the first examples is described and some of their properties are recorded. The near-quantitative conversion of sulfenyl nitrates to thiolsulfonate esters (2 RSONO2 yields RSO2SR + 2NO2) is demonstrated and interpreted as a dimerization reaction of sulfinyl radicals. (Author)

AD-621 226 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
RESEARCH ON THE CHEMISTRY OF THIOPEROXIDES (SULFENYL ESTERS).
Final rept.,
by Norman Kharasch. 21 Jun 61, 4p. Contract AF49 638 330
AFOSR , 969

Unclassified report

Descriptors: (*Organic sulfur compounds, Chemistry), Peroxides, Esters, Halides, Pyrolysis, Synthesis (Chemistry), Alcohols, Chemical reactions

Brief summaries are given of work in the following areas: pyrolysis of t-butyl esters of sulfenic acids; syntheses of halides of sulfenyl esters; mechanisms of reactions of sulfenyl halides with alcohols.

AD-621 229 Div. 4/3 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y INST OF POLYMER RESEARCH
PEROXIDE DECOMPOSITION AND CAGE EFFECT,
by W. Braun, L. Rajbenbach, and F. R. Eirich.
1961, 7p. Contract AF49 638 331
AFOSR , 2062

Unclassified report

Descriptors: (*Peroxides, Decomposition), (*Free radicals, Peroxides), Reaction kinetics, Chemical equilibrium, Probability, Recombination reactions, Esters, Pyrolysis, Viscosity

The decomposition of acetyl peroxide is discussed in terms of cage theory and a rate constant for the decarboxylation of the resultant acetoxy free radical is derived.

AD-621 230 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
DERIVATIVES OF SULFENIC ACIDS. XXXII. STUDIES OF THIOPEROXIDES. PART 4. REACTIONS OF TRICHLOROMETHANE SULFENYL CHLORIDE WITH 1,2EPOXIDES AND ALCOHOLS,
by Robert B. Langford, and Norman Kharasch.
1958, 7p.
AFOSR , TN-58-428

Unclassified report

Descriptors: (*Organic sulfur compounds, Chemical reactions), Peroxides, Esters, Chlorine compounds, Catalysts, Amines, Molecular isomerism, O-heterocyclic compounds, Alcohols

Trichloromethane sulfenyl chloride (I) reacts with 1,2epoxides and with meso-butadiene dioxide to form betachloroalkyl trichloromethane sulfenates. The reaction is catalyzed by t-amines and identical products are obtained by substituting appropriate beta-chloro alcohols for the epoxides. The results agree with the mechanism which postulates trans opening of the epoxide rings, as previously suggested for the similar reactions of 2,4-dinitrobenzene sulfenyl chloride. The new products from reaction of I with epoxides and certain alcohols are reported. (Author)

AD-621 235 Div. 4/3 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y
DIACETYL PEROXIDE DECOMPOSITION CAGE EFFECTS,
by Walter Braun. 1962, 3p. Contract AF49 638 331

Unclassified report

Descriptors: (*Peroxides, Decomposition), (*Free radicals, Peroxides), Organic solvents, Molecular association, Pyrolysis, Reviews, Recombination reactions

A review is given, with 18 references, concerning the decomposition of diacetyl peroxide and the cage effect theory.

AD-621 237 Div. 4/3 ,14/8
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)
MODEL POLYETHERS I. SYNTHESIS BY THE WILLIAMSON REACTION,
by T. P. Hobin. Dec 64, 10p. Rept. no. WAC/160/057

Unclassified report

Pub. in Polymer v6 p403-9 1965 (Copies available only to DDC users).

Descriptors: (*Ethers, Polymerization), (*Polymers, Models (Simulations), Glycols, Synthesis (Chemistry), Chromatographic analysis, Spectra (Infrared), Great Britain

Model polyalkylene ethers H ((CH2)xO)y (CH2)xH and trialkyleneglycols OH ((CH2)xO)3H, where x=4, 5, 6 and 10 any y=2, 3 and 4, were synthesized by the Williamson reaction. Attempts to prepare the corresponding compounds where x=3 were only partly successful.

AD-621 263 Div. 4/3
OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY
A CONVENIENT SYNTHESIS OF ESTERS OF DIPHENYLPHOSPHINIC ACID. III,
by K. Darrell Berlin. 23 Oct 64, 5p. Contract AF AFOSR132 65 Proj. 9762 Task 976202
AFOSR , 65-1261

Unclassified report

Pub. in Journal of Organic Chemistry v30 p1267-8 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organic phosphorus compounds, Synthesis (Chemistry)), Esters, Chlorides, Alcohols, Spectra (Infrared), Nuclear magnetic resonance

A report is made of the synthesis of several new phosphinates of the type (C6H5)2P (O)OR, which involves a reaction between diphenylphosphinic chloride and the corresponding alcohol in the presence of triethylamine in ether. The method is superior to others with respect to simplicity of isolation of relatively pure products and with respect to yields of esters. Data from IR analyses and nuclear magnetic resonance examinations are given. (Author)

AD-621 272 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
PRINCETON UNIV N J
PHOTONOMETRIC TITRATIONS.
Final rept. for 1 Sep 58-31 Aug 63,
by C. G. Enke. 31 Aug 63, 12p. Contract AF49 638 467 Proj. 9710 Task 971003
AFOSR , 65-1443

Unclassified report

Descriptors: (*Photochemistry, Volumetric analysis), (*Photons, Chemical indicators), (*Volumetric analysis, Photochemistry), (*Hydrogen peroxide, Photochemistry), Quantitative analysis, Carboxylic acids, Impurities, Sensitivity

The possibility of using light as a quantitative reagent in chemical reactions was investigated. Photolytic reactions with a reproducible quantum yield and whose products are generally useful analytical reagents, e.g., oxidizing or reducing agents, were studied. The photochemical generation of hydrogen peroxide from solutions of various organic acids was investigated for quantitative interest. It was found that dissolved oxygen was a required reactant and determined directly the amount of peroxide formed. Photochemical generation of reactant was used for the photolytic determination of trace amounts of organic material in water. The technique proved to be extremely sensitive. A list of resulting publications is included. (Author)

AD-621 305 See Fld. 11/9

AD-621 316 Div. 4/3 ,4/2
MELLON INST PITTSBURGH PA
ORGANOSULFUR DERIVATIVES OF THE METAL CARBONYLS. VII. REACTIONS BETWEEN CHLOROALKYL SULFIDES AND METAL CARBONYL ANIONS,
by R. B. King, and M. B. Bisnette. 2 Nov 64, 11p. Contract AF AFOSR580 64 Proj. 9710 Task 971002
AFOSR , 65-1133

Unclassified report

Pub. in Inorganic Chemistry v4 n4 p486-93 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyclopentanes, Complex compounds), (*Organic sulfur compounds, Complex compounds), Carbon compounds, Metalorganic compounds, Sulfides, Aliphatic compounds, Sodium compounds, Molybdenum compounds, Chlorine compounds, Tungsten compounds, Manganese compounds, Iron compounds, Molecular structure, Ions

Treatment of NaMo (CO)3C5H5 with chloromethyl methyl sulfide at room temperature gives

the yellow crystalline tricarbonyl sigma-CH3SCH2Mo (CO)3C5H5. Upon heating or ultraviolet irradiation this tricarbonyl is converted to a yellow-orange crystalline dicarbonyl pi-CH3SCH2Mo (CO)2C5H5, with the CH3SCH2 group bonded to the metal atom both by metal-carbon and metal-sulfur bonds. The related pi-CH3SCH2W (CO)2C5H5 and yellow liquid pi-CH3SCH2Mn (CO)4 may be obtained from chloromethyl methyl sulfide and NaW (CO)3C5H5 or NaMn (CO)5, respectively, at 65-85 degrees. Treatment of NaFe (CO)2C5H5 with chloromethyl methyl sulfide at room temperature gives brown liquid sigma-CH3SCH2Fe (CO)2C5H5. Treatment of NaFe (CO)2C5H5 with 2-chloroethyl methyl sulfide gives yellow-brown liquid CH3SCH2CH2Fe (CO)2C5H5. Irradiation of this compound in benzene solution gives the red crystalline isomeric acyl compound CH3SCH2CH2COFeCOC5H5 (V) as well as the known compounds (CH3SFeCOC5H5)2, CH3SFe (CO)2C5H5, and (C5H5Fe (CO)2)2. Treatment of NaMn (CO)5 with 2-chloroethyl methyl sulfide in boiling tetrahydrofuran gives the yellow crystalline acyl compound CH3SCH2CH2COMn (CO)4. The structures of the new compounds are discussed. (Author)

AD-621 384 See Fld. 20/2

AD-621 406 Div. 4/3
CINCINNATI UNIV OHIO
SYNTHESES WITH ALPHA-AMINO ALKYL PHOSPHONIC ACID ESTERS ((SYNTHESEN MIT ALPHA-AMINO-ALKYL-PHOSPHONSAUREESTERN, I),
by Hans Zimmer, and Jeno Peter Bercz. 8 Dec 64, 9p. Contract DA ARO D31 124G122
AROD , 2276:11-C

Unclassified report

Reprint in German. Pub. in Liebigs Ann. Chem. v686 p107-14 1965 (Copies available only to DDC users).

Descriptors: (*Phosphonic acids, Synthesis (Chemistry)), Amines, Pyrimidines, Hydrolysis, Molecular isomerism

Es wird eine einfache Synthese von aromatisch substituierten Enaminen und Amidinen beschrieben. Sie beruht auf der Umsetzung der tieffarbigen Anionen von alphaAmino-alkyl-phosphonsaureestern mit Aldehyden. Die Hydrolyse der Enamine fuhrt zu den erwarteten Desoxybenzoinen. Die neue Methode zeichnet sich durch apparative Einfachheit aus. Sie ist besonders bemerkenswert dadurch, dass man, je nach der Reihenfolge in der die Reaktionspartner eingefuhrt werden, das eine oder das andere der isomeren Enamine bzw. Desoxybenzoine, d. h. entweder R - CO - CH2 - R' oder R - CH2 - CO - R', erhalten kann. (Author)

AD-621 410 Div. 4/3
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
SULFENIUM IONS AND SULFENYL COMPOUNDS,
by Norman Kharasch. 1961, 23p. Contract AF49 638 718
AFOSR , 2323

Unclassified report

Pub. in mono Organic Sulfur Compounds, New York, 1961 vl p375-96 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organic sulfur compounds, Reaction kinetics), Chemical reactions, Theory, Free radicals, Ions, Synthesis (Chemistry)

The broad scope of the field of sulfenyl compounds is re-emphasized by a general definition of R and X in RSX and by an evaluation of the ionic reactions of such substances. Methods for generating sulfenium ions are described and evidence for the existence of such ions in solution discussed. Brief mention is also made of some free-radical reactions involving sulfenyl compounds. The analogies between displacements from carbon in alkyl and acyl compounds and sulfenyl compounds are noted. A summary of analytical, biochemical, synthetic and theoretical interests in sulfenyl compounds is included. (Author)

AD-621 469 See Fld. 7/4

AD-621 470 Div. 4/3
PURDUE UNIV LAFAYETTE IND DEPT OF CHEMISTRY
THE CHEMISTRY OF ALIPHATIC AND ALICYLLIC NITRO COMPOUNDS. XXII. THE ACTION OF ACIDS ON NITRONIC ESTERS AND NITROPARAFFIN SALTS. CONCERNING THE MECHANISMS OF THE NEF AND THE HYDROXAMIC ACID FORMING REACTIONS OF NITROPARAFFINS,
by Nathan Kornblum. 20 Nov 64, 8p. Contract AF AFOSR122 65 Proj. 9762 Task 976202
AFOSR , 65-1260

Unclassified report

Pub. in Journal of the American Chemical Society v87 n8 p1742-7 Apr 20 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organic nitrogen compounds, Chemical reactions), Acids, Esters, Salts, Amides, Decomposition, Nitrobenzenes, Sulfuric acid, Hydrochloric acid, Aldehydes

Nitronic esters are rapidly decomposed by acids; the course which the reaction follows is strongly dependent on the acid concentration. Thus, the ethyl nitronic ester of p-nitrophenylnitromethane gives p-nitrobenzaldehyde in 80% yield on treatment with 4 N sulfuric acid while, in contrast, 31 N sulfuric acid converts it into pnitrobenzhydroxamic acid in 98% yield. The reaction of nitroparaffin salts with sulfuric acid also exhibits this dependence on acid concentration. The mechanisms of these new nitronic ester reactions, and of the Nef and the hydroxamic acid forming reactions of nitroparaffins, are discussed in the light of these facts. (Author)

AD-621 472 Div. 4/3 ,4/4
ROCHESTER UNIV N Y DEPT OF CHEMISTRY
BENZENE D-6-SENSITIZED PHOTOISOMERIZATION OF BUTENE-2 AT LOW PRESSURES BY LONG-PATH INFRARED SPECTROSCOPY,
by Paul Sigal. 12 Oct 64, 8p. Contract AF AFOSR206 63
AFOSR , 65-1257

Unclassified report

Pub. in The Journal of Chemical Physics v42 n6 p1953-7 15 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Alkenes, Molecular isomerism), (*Stereochemistry, Alkenes), (*Photochemistry, Alkenes), (*Infrared spectroscopy, Alkenes), Aromatic compounds, Atomic orbitals, Sensitivity, Vacuum, Fluorescence

The benzene d-6-sensitized trans-cis photoisomerization of butene-2 has been studied by means of long-path infrared spectroscopy. Relative quantum yields at pressures less than 1 mm were determined. Mechanisms for energy transfer in benzene d-6 consistent with the data are presented. (Author)

AD-621 504 Div. 4/3
OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY
MERCAPTAN-DISULFIDE INTERCHANGE REACTIONS. III. REACTION OF CYSTEINE WITH 4,4'-DITHIO BIS (BENZENE-SULFONIC ACID),
by H. A. Smith, Gavin Doughty, and George Gorin. 23 Oct 63, 5p. Contract DA49 193MD2251 AT11 1 71

Unclassified report

Pub. in Journal of Organic Chemistry, v29 p1484-8 Jun 1964. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Organic sulfur compounds, Chemical reactions), (*Amino acids, Chemical reactions), Thiols, Sulfides, Sulfonates, Sodium compounds, Spectra (Visible + ultraviolet), Ionization, Chemical equilibrium, Reaction kinetics

Sodium 4,4'-dithio bisbenzenesulfonate (Na2BSSB) was prepared from sulfanilic acid. The ultraviolet absorption spectra were determined for BSSB, the mixed disulfide formed from it upon reaction with cysteine (BSSR), 4-mercaptobenzenesulfonate (BSH), and its mercaptide ion (BS (-)). The ionization constant of BSH is 10 to the -5.7 power. The following equilibrium constants were measured: ((BSSR) (BSH))/ ((BSSB) (RSH)) = 1.2 and ((RSSR) (BSH))/ ((BSSR) (RSH)) = 1.0 at 25C. The ionization of BSH tends to drive the reaction of cysteine with BSSB toward completion at pH values above 6.5. Some measurements of reaction rate are reported. (Author)

AD-621 526 Div. 4/3
CFSTI Prices: HC $2.00 MF $0.50
CORNELL UNIV ITHACA N Y
THE MECHANISM OF A DIELS-ALDER REACTION, I. THE MECHANISMS OF PERESTER AND DIACYL PEROXIDE CLEAVAGE, II. THERMAL TELOMERIZATION OF DIMETHYL ACETYLENEDICARBOXYLATE, III.
Final rept.,
by M. J. Goldstein, G. L. Thayer Jr., and M. Yoshida. Aug 65, 26p. Contract AF AFOSR142 63
AFOSR , 65-1800

Unclassified report

Descriptors: (*Diene synthesis, Isotopes), (*Esters, Decomposition), (*Peroxides, Decomposition), (*Molecular isomerism, Thermochemistry), Reaction kinetics, Chemical bonds, Carboxylic acids, Acetates, Nuclear magnetic resonance

AD-621 538 Div. 4/3 ,25/2
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
SEARCH FOR A CHARGE-TRANSFER STATE IN CRYSTALLINE ANTHRACENE,
by R. S. Berry, Joshua Jortner, John C. Mackie, Eugene S. Pysh, and Stuart A. Rice. 6 Oct 64, 8p. Contract AF AFOSR781 65 Proj. 9760 Task 976001
AFOSR , 65-1219

Unclassified report

Pub. in Journal of Chemical Physics v42 n5 p1535-40 Mar 1 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Ionization potentials, Polycyclic compounds), (*Polycyclic compounds, Crystals), Excitation, Molecular properties, Polarization, Crystal lattices, Electron transitions, Infrared spectroscopy, Ultraviolet spectroscopy

The calculation is examined of the location of the chargetransfer state in crystalline anthracene. Also reported are the results of spectroscopic experiments designed to find the transition from the ground state to the charge-transfer state. No experimental evidence could be found for this transition, and it is thereby concluded that: (a) The CT state lies above the first excition state in anthracene. (b) The polarization energy in the CT state is much less than that calculated on the basis of classical considerations. There is a brief discussion of the nature of the polarization in aromatic crystals, especially with respect to Conclusion (b). (Author)

AD-621 554 Div. 4/3
CFSTI Prices: HC $1.00 MF $0.50
NORTH CAROLINA UNIV CHAPEL HILL

791-314 O-65—9

THE SYNTHESIS OF A MOLECULAR CAGE.
Final rept. for 1 Sep 61-31 Aug 65,
by James P. Collman. 31 Aug 65, 6p. Contract DA ARO D31 124G185

Unclassified report

Descriptors: (*Complex compounds, Synthesis (Chemistry)), Transiton elements, Monocyclic compounds, Rhenium compounds, Oxidation, Atomic orbitals, Stereochemistry

A summary is given of researches concerning the chemistry of metal acetylacetonate chelate rings, and the oxidative addition reactions of Group VIII complexes having a D (8) configuration. A list of publications and papers issued as a result of the work is included.

AD-621 566 See Fld. 11/8

AD-621 591 See Fld. 6/1

AD-621 596 Div. 4/3 ,4/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
EFFECT OF PRESSURE AND TEMPERATURE ON THE RATE OF THE ACID-CATALYZED HYDRATION OF ETHYLENE,
by B. T. Baliga, and E. Whalley. 9 Apr 65, 5p.
Rept. no. NRC-8476

Unclassified report

Pub. in Canadian Journal of Chemistry v43 p2453-6 1965 (Copies available only to DDC users).

Descriptors: (*Alkenes, Reaction kinetics), (*Alcohols, Synthesis (Chemistry)), Pressure, Temperature, Perchloric acid, Catalysis, Thermochemistry, Entropy, Water

The rate of hydration of ethylene in dilute aqueous perchloric acid was measured in the range 170-190C at 100 bars and 100 to 3 000 bars at 180C. The energy, entropy, and volume of activation are 33.3 = about 1 kcal/mole, -5.7 = about 2.5 cal/deg/mole, and -15.5 = about 1.5 cu cm/mole respectively. The volume of activation shows that at least one molecule of water is strongly bound in the transition state. (Author)

AD-621 608 Div. 4/3 ,4/4
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
DIRECT OBSERVATION OF THE ANTHRYLETHYL BRIDGED CATION,
by Lennart Eberson, and S. Winstein. 18 May 65, 3p.
AROD , 3580:17

Unclassified report

Pub. in the Journal of the American Chemical Society, v87 n15 p3506-7 Aug 5 1965. (Copies not available to DDC or Clearinghouse customers). Presented at the Japanese-American Seminar in Physical Organic Chemistry, Kyoto, Japan April 6-10, 1965. See also AD-621 609.

Descriptors: (*Free radicals, Nuclear magnetic resonance), (*Polycyclic compounds, Free radicals), (*Nuclear magnetic resonance, Polycyclic compounds), Spiro compounds, Alcohols, Ions, Stereochemistry

Observations of the nuclear magnetic resonance spectrum of a bridged anthrylethyl cation (anthracine with a cyclopropane ring spiro at the 5 position) in SO2SbF5 are reported.

AD-621 609 Div. 4/3 ,4/4
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
THE NEIGHBORING ANTHRYL GROUP IN SOLVOLYSIS,
by Lennart Eberson, John P. Petrovich, R. Baird, D. Dyckes, and S. Winstein. 18 May 65, 4p.
AROD , 3580:16

Unclassified report

Pub. in Journal of the American Chemical Society, 87 n15 p3504-6 Aug 5 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Polycyclic compounds, Chemical reactions), (*Hydrolysis, Polycyclic compounds), Spiro compounds, Alcohols, Synthesis (Chemistry), Volumetric analysis, Stereochemistry, Ions

The behavior of the anthryl-5-ethyl system in solvolysis is reported. It was found that a bridged anthrylethyl cationic intermediate is formed which transforms to a 5-spiro cyclohexyl anthran-10-ol.

AD-621 611 Div. 4/3
CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY
HOMOTROPYLIUM ION AND ITS MOLYBDENUM TRICARBONYL COMPLEX,
by S. Winstein, H. D. Kaesz, C. G. Kreiter, and Edwin C. Friedrich. 1 Jun 65, 4p.
AROD , 3580:18

Unclassified report

Pub. in Journal of the American Chemical Society, v87 n14 p3267-9 Jul 20 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Complex compounds, Molecular structure), (*Free radicals, Molecular structure), (*Molybdenum compounds, Complex compounds), (*Cyclooctatetraene, Complex compounds), Ions, Atomic orbitals, Nuclear magnetic resonance, Chemical bonds

The cyclo-octatetraene complex C8H8M0 (CO)3 was prepared for the first time and some of its properties were examined. A comparison of a protonated cationic form of this complex with the related C8H9 (+)Fe (CO)3 cation strongly supports nonclassical homotropylium structures for the former complex and the C8H9 (+) free ion.

AD-621 614 Div. 4/3
NOYES CHEMICAL LAB UNIV OF ILLINOIS URBANA
THE SYNTHESES AND PROPERTIES OF SOME COMPLEXES DERIVED FROM SULPHAMIDE,
by A. Ouchi, and T. Moeller. 19 Jan 65, 8p. Contract DA31 124ARO D35
AROD , 3815:4

Unclassified report

Pub. in Journal of Inorganic and Nuclear Chemistry, v27 p1635-41 1965. (Copies available only to DDC users).

Descriptors: (*Complex compounds, Synthesis (Chemistry)), (*Sulfuric acid, Amides), (*Amides, Complex compounds), Copper compounds, Ammonia, Amines, Spectra (Infrared), Spectra (Visible + ultraviolet)

By means of reactions involving sulphamide, various amines or ammonia, and certain dipositive metal ions, a number of solid adducts have been isolated. These include compounds of the types M (BB) (Su)X2, M (BB)2 (Su) X2, and M (BB)2 (Su)2X2 where M is commonly Cu, BB is two molecules of ammonia or a diamine such as H2 NC2H4NH2 (en), H2NCH2CH (CH3)NH2 (1,2-pn), or H2 NC3H6NH2 (1,3-pn), Su is sulphamide, and X is a uninegative ion or half a dinegative ion. Such adducts are stable in the solid state but decompose into the corresponding metal ammine complex and sulphamide in contact with water. The infra-red spectra indicate only weak interactions between sulphamide and the metal ions. N-substituted sulphamides and substituted de-ammonation products of sulphamide are even weaker ligands than sulphamide. (Author)

AD-621 620 Div. 4/3
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
ORGANIC QUANTUM CHEMISTRY. X. THE CALCULATED ELECTRONIC SPECTRA AND STRUCTURES OF SOME CYCLIC CONJUGATED HYDROCARBONS,
by Norman L. Allinger, Mary Ann Miller, Libby W. Chow, R. A. Ford, and J. C. Graham. 1 Feb 65, 7p. Contract DA ARO D31 124G494
AROD , 4127:3

Unclassified report

Pub. in Journal of the American Chemical Society v87 n15 p3430-5 Aug 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Monocyclic compounds, Molecular structure), (*Cyclooctatetraene, Molecular structure), (*Ultraviolet spectroscopy, Monocyclic compounds), Hydrocarbons, Chemical bonds, Atomic orbitals, Aromatic compounds

The ground-state conformations of cyclooctatetraene and tropilidene were calculated to be nonplanar by a combination of Pariser-Parr-type treatments of the pisystems and Westheimer treatments of the sigmasystems. The barriers to inversion were calculated, and were in fair agreement with experiment. Heptalene was similarly calculated to be very close to planar. The ultraviolet spectra of these molecules were also calculated, and were in reasonable agreement with experiment. (Author)

AD-621 623 Div. 4/3
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
CONFORMATIONAL ANALYSIS, XLIII. STEREOCHEMICAL STUDIES IN THE CYCLOBUTANE RING SYSTEM,
by Norman L. Allinger, and Leonard A. Tushaus. 2 Dec 64, 8p. Contract DA20 018ORD22743 Grant ,DA ARO D31 124G494
AROD , 4127:4

Unclassified report

Pub. in Journal of Organic Chemistry v30 p1945-51 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyclobutanes, Stereochemistry), (*Stereochemistry, Cyclobutanes), Molecular isomerism, Synthesis (Chemistry), Enthalpy, Chemical equilibrium, Esters

The cis and trans isomers of 1,3-dimethylcyclobutane were prepared by sterospecific synthesis and the earlier geometric assignments were found to be reversed. The cis isomer is inferred to be of lower enthalpy. The cis and trans isomers of methyl 3-methylcyclobutanecarboxylate were prepared by stereospecific reactions and equilibrated. The cisisomer predominates over the trans at equilibrium. The cis- and trans-dimethyl 1,3-cyclobutanedicarboxylates were equilibrated. The greater stability of the trans isomer appears to be due to dipole-dipole interactions. (Author)

7/4. PHYSICAL CHEMISTRY

AD-620 817 Div. 4/4
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE APPLICATION OF GAS CHROMATOGRAPHY IN RESEARCH OF SURFACE CHEMISTRY AND CATALYTIC REACTIONS,
by Chang Sue, and Lau Nan Chuan. 18 Aug 65, 45p. Rept. no. FTD-TT-65-331
TT , 65-63860

Unclassified report

Edited trans. of K'o Hsueh T'ung Pao (Chinese People's Republic) n8 p28-44 1963.

Descriptors: (*Chromatographic analysis, Reviews), (*Catalysis, Chromatographic analysis), Surface properties, Chemistry, Adsorption, Surface area, Thermochemistry, Reaction kinetics, China

AD-620 832 See Fld. 6/15

AD-620 843 See Fld. 7/3

AD-620 844 Div. 4/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
THE FINE STRUCTURE OF THE 2P TERMS OF THE LITHIUM ISOELECTRONIC SEQUENCE.
Scientific rept.,
by K. L. Bell. 1965, 6p. Rept. no. SR-5
Contract AF61 052 780
AFCRL , 65-650
Unclassified report

Descriptors: (*Atomic energy levels, Lithium), Atomic spectroscopy, Electron transitions, Spin, Great Britain

Analytic Hartree-Fock functions have been used to make ab initio calculations of the fine structure separations of the ls2np2P, n = 2 and 3, states of the three electron systems. Satisfactory agreement with experiment is obtained except in the case of the lightest elements. (Author)

AD-620 848 Div. 4/4 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
GRONINGEN UNIV (NETHERLANDS) LAB OF CHEMISTRY
THE MAGNETIC TRANSITION IN WURSTER'S BLUE PERCHLORATE.
Scientific rept.,
by Gerard T. Pott, and Jan Kommandeur. 29 Apr 65, 9p. Rept. no. SR-1
Contract AF61 052 769
AFCRL , 65-428
Unclassified report

Descriptors: (*Chemical indicators, Magnetic properties), (*Amines, Disproportionation), Perchlorates, Paramagnetic materials, Transformations, Spectra (Visible + ultraviolet), Phosphorescence, Electrical conductance, Netherlands

A study was made of the magnetic transition in Wurster's Blue Perchlorate. From the spectroscopic and magnetic evidence it follows that the transition is due to a disproportionation of the tetra-methyl-p-phenylenediamine ion : TMPD (+) yields TMPD (++) + TMPD. Connected with this is a surprisingly high conductivity in the transition range. (Author)

AD-620 868 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV DAVIS
PHOTOCHEMICAL STUDIES IN SOLUTION.
Final rept. for 1 Oct 62-31 Aug 65,
by David H. Volman. 31 Aug 65, 7p. Contract DA ARO D31 124G384 ,DA ARO D31 124G529 Proj. 3861C
AROD , 3861:2
Unclassified report

Descriptors: (*Photochemistry, Solutions), (*Uranyl radicals, Photochemistry), (*Oxalates, Photochemistry), (*Hydrogen peroxide, Photochemistry), Photometers, Complex compounds, Alcohols

A summary is given of work involving (1) the study uranyl oxalate from the viewpoint of its use as an actinometer and to contribute to an understanding of the photochemistry of metal ion complexes; and (2) the mechanisms of hydroxyl radical reaction from photochemically decomposed hydrogen peroxide.

AD-620 895 See Fld. 21/2

AD-620 939 Div. 4/4 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
CALCULATED PHOTOIONIZATION CROSS SECTION OF HELIUM AND THE ALKALAIS.
Technical rept.,
by E. J. McGuire. Jul 65, 44p. Rept. no: TR-13
Contract Nonr40137 Proj. NR017 625
Unclassified report

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Descriptors: (*Gas ionization, Probability), (*Helium, Gas ionization), (*Alkali metals, Ionization), Atomic orbitals, Excitation, Photochemistry, Ultraviolet radiation, X rays, Dipole moments, Integration, Atomic energy levels

The use of the model orbitals for the active electron orbital in the continuum leads to cross sections is shown to be in good agreement (except lithium) with experiment. However for systems in their ground state it is generally necessary to perform a numerical integration.

AD-620 943 Div. 4/4
LEHIGH UNIV BEHTLEHEM PA DEPT OF CHEMISTRY
STUDIES OF SPREADING, COLLAPSE, AND TEMPERATURE AND COMPRESSION RATE EFFECTS OF MONOLAYERS OF ALPHA, OMEGA-DICARBOXYLIC ACIDS,
by Peter M. Jeffers, and Jerome Daen. 28 Jan 65, 6p. Contract DA ARO D31 124G341
AROD , 3603:2
Unclassified report

Pub. in Journal of Physical Chemistry v69 p2368-73 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Monomolecular films, Carboxylic acids), (*Carboxylic acids, Monomolecular films), Physical properties, Degradation, Water, Ammonium compounds, Sulfates, Molecular structure, Stabilization, Thermal properties, Compressive properties

Monolayers of alpha, omega-dicarboxylic acids with 12, 14, 16, 20, and 24 methylene groups were studied under conditions of varying compression rate and temperature on both acidified distilled water and concentrated ammonium sulfate solution substrates. The surface pressure isotherms indicated that both carboxyls are bound to the substrate and that there is some buckling of the hydrocarbon chain. Measurements of surface potentials and the temperature dependence of the equilibrium spreading pressure support this conclusion. Acidified ammonium sulfate substrates stabilized the films, reduced solution, and caused an increase in the surface potential and collapse pressures; collapse areas, however, were essentially unaltered. Equilibrium spreading pressure measurements indicated that most portions of the spread monolayer isotherms refer to nonequilibrium states; this fact explains the pi-A dependence on compression rate. A collapse mechanism involving a 'rolling-over' process is proposed. (Author)

AD-620 948 Div. 4/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DISTRIBUTION OF DROPS ACCORDING TO SIZE IN ATOMIZING LIQUIDS BY MEANS OF CENTRIFUGAL ATOMIZERS,
by L. G. Golovkov. 3 Jun 65, 14p. Rept. no. FTD-TT-65-176
TT , 65-63902
Unclassified report

Unedited rough draft trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v7 n11 p55-61 1964.

Descriptors: (*Drops, Distribution), (*Atomization, Centrifuges), Statistical functions, Thermodynamics, USSR, Statistical mechanics

The article presents further support of the function of distribution of drops according to size proposed in a work by Tresh, explains the method of parameter derivation for this function and establishes the numerical value of its parameters for centrifugal atomizers. (Author)

AD-620 969 See Fld. 14/2

AD-620 980 See Fld. 20/13

AD-620 991 See Fld. 7/2

AD-620 999 See Fld. 7/3

AD-621 010 See Fld. 7/3

AD-621 015 Div. 4/4 ,4/3
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
VAPOR PRESSURE STUDIES ON METAL CHELATES.
Master's thesis,
by Walter Allan Frankhauser. Jun 65, 49p.
Rept. no. GNE/PHYS/65-7
Unclassified report

Descriptors: (*Metalorganic compounds, Complex compounds), (*Complex compounds, Vapor pressure), Gas analysis, Chromatographic analysis, Aldehydes, Ketones

The vapor pressures of several metal chelates of acetylacetone, trifluoroacetylacetone and hexafluoroacetylacetone were measured in the temperature range 40 to 140C by the effusion and isoteniscope methods. The results showed large differences from the literature values, where available, and a qualitative discussion is offered to illustrate the major sources of error in the experiments. A comparison between the experimental vapor pressure trends among the chelates and the observations made with regard to the order of elution of the chelates in gas chromatography showed that for the chelates of a given metal atom, the volatility increased with increasing fluorination of the ligand and the time for elution from the chromatographic column decreased. (Author)

AD-621 017 Div. 4/4 ,20/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
PRELIMINARY STUDY OF NEUTRON ACTIVATION ANALYSIS SERVICE: GAMMA-RAY SCINTILLATION SPECTROMETRY AND SPECTRUM ANALYSIS.
Master's thesis,
by Richard S. Burns. Aug 65, 100p. Rept. no. GNE/PH/65-1
Unclassified report

Descriptors: (*Neutron activation, Gamma-ray spectroscopy), (*Gamma-ray spectroscopy, Scintillation counters), Quantitative analysis, Spectrum analyzers, Gamma counters, Pulse height analyzers, Least squares method, Programming (Computers), Photomultipliers, Gain, Sodium compounds, Iodides, Thallium

This thesis is divided into three main parts: A study of the general considerations of Neutron Activation Analysis (NAA); Instrumental approach to gamma-ray spectrum analysis including the assembly of a scintillation spectrometer based on Heath's layout and comparison of data with his spectrum data; Comparative least-squares gamma-ray spectrum analysis of a composite spectrum using an IBM 7094 II Computer is developed.

AD-621 079 See Fld. 6/15

AD-621 158 See Fld. 20/8

AD-621 199 See Fld. 21/2

AD-621 212 See Fld. 7/3

AD-621 216 Div. 4/4 ,10/7
CFSTI Prices: HC $2.00 MF $0.50
MANCHESTER COLL OF SCIENCE AND TECHNOLOGY (ENGLAND) DEPT OF CHEMISTRY
INHIBITION OF THE THERMAL REACTION BETWEEN HYDROGEN AND OXYGEN.
Final scientific rept.,
by D. R. Blackmore, D. R. Clark, and R. F. Simmons. 1 Mar 65, 30p. Contract AF EOAR62 88
AFOSR , 65-1239
Unclassified report

Descriptors: (*Hydrogen, Chemical reactions), (*Oxygen, Chemical reactions), (*Flame propagation, Inhibition), Hydrochloric acid, Hydrogen compounds, Bromides, Reaction kinetics, Explosions, Great Britain

The kinetics of the inhibiting action of hydrogen bromide and hydrogen chloride on the thermal reaction between hydrogen and oxygen was investigated. Hydrogen bromide was found to be a very effective inhibitor of the reaction, while hydrogen chloride was relatively inefficient. The kinetic characteristics of the inhibition were examined, and it was shown that in the case of hydrogen bromide the primary inhibition step is: H + HBr yields H2 + Br. Only a fraction of the bromine atoms produced in this reaction react to give chain termination, however, and the majority react to give chain propagation by: Br + H2 yields HBr + H. It is suggested that chain termination occurs by: Br + HO2 yields HBr + O2. The corresponding mechanism is also operative when hydrogen chloride is the inhibitor, but a second primary inhibition step is also important in this case: OH + HCl yields H2O + Cl. The reason for the marked difference in efficiency of hydrogen bromide and hydrogen chloride is discussed. (Author)

AD-621 228 See Fld. 11/9

AD-621 229 See Fld. 7/3

AD-621 235 See Fld. 7/3

AD-621 236 Div. 4/4 ,10/5 ,4/2
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM ABBEY (ENGLAND)
ACID-BASE PROPERTIES OF HYDROGEN PEROXIDEWATER MIXTURES,
by A. J. Dedman, P. Flood, T. J. Lewis, D. H. Richards, and D. A. Salter. 21 Jan 64, 10p. Rept. no. WAC/153/026 ,Offprint-65/11
Unclassified report

Pub. in Journal of the Chemical Society n645 p3505-12 Jun 1965 (Copies available only to DDC users).

Descriptors: (*Hydrogen peroxide, Acid-base reactions), (*Acid-base reactions, Hydrogen peroxide), (*Liquid rocket oxidizers, Impurities), Water, Mixtures, Carboxylic acids, Solubility, Dissociation, Thermochemistry

The dissociation constants of a number of weak acids in hydrogen peroxide-water mixtures have been redetermined. These acids fall into two categories typified by picric acid and acetic acid, respectively. It is shown that the difference between these groups is not due to the formation of peracids, but may be explained in terms of the solvation properties of the undissociated acids resulting in widely different molar free energies of transfer from water to hydrogen peroxide-water mixtures. The solubility of picric acid and the solubility products of a number of salts have been measured over a range of hydrogen peroxide concentrations, and molar free energies of transfer estimated. If certain extrathermodynamic assumptions are accepted, it is shown that all values of free energy of transfer are small except for those of the H3O (+) and O2H (-) ions, and the undissociated acids in the acetic class. (Author)

AD-621 244 Div. 4/4 ,25/7
GEORGETOWN UNIV WASHINGTON D C DEPT OF PHYSICS
POWER SERIES EXPANSIONS OF VIBRATIONAL POTENTIALS. III. THE WANG POTENTIAL FOR H2,
by Charles L. Beckel, and Joseph P. Sattler. 25 Nov 64, 4p. Contract AF AFOSR62 160 Proj. 9767 Task 976701
AFOSR , 65-1340
Unclassified report

Pub. in Journal of Chemical Physics, v42 n7 p2620-1 Apr 1 1965. (Copies not available to DDC or Clearinghouse customers). See also AD-613 800.

Descriptors: (*Hydrogen, Band spectrum), (*Diatomic molecules, Series), (*Series, Diatomic molecules), Chemical bonds, Vibration, Potential theory

In an analysis of Lyman bands of H2, a determination is made of the spectroscopic constants of the Wang potential derived from an electronic wavefunction with exchange symmetry and variable screening, but with no explicit ionic term. These constants are compared with Heitler-London, Weinbaum, and experimental values for H2. The Wang constants are accurate to within 1 in the last digit. (Author)

AD-621 254 Div. 4/4 ,25/8
CFSTI Prices: HC $4.00 MF $0.75
REACTION MOTORS DIV THIOKOL CHEMICAL CORP DENVILLE N J
RE-EXAMINATION OF NUCLEATION AND CONDENSATION OF WATER.
Technical rept.,
by Welby G. Courtney. Sep 65, 104p. Rept. no. RMD-5515
Contract Nonr415400 Proj. NR092 517
Unclassified report

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Descriptors: (*Nucleation, Water vapor), (*Condensation, Water vapor), (*Water vapor, Nucleation), Vapors, Thermodynamics, Theory, Mathematical analysis, Phase studies, Surface properties, Cloud chambers, Water

The paper re-examines several theoretical and interpretive problems in homogeneous nucleation from the vapor phase. A theory of cluster thermodynamics is presented wherein clusters are considered to have the classical macroscopic surface energy and also the translation and rotation energies noted by Lothe and Pound. The resulting equilibrium concentrations of clusters are about 10 to the 20th power greater than predicted by the classical liquid-drop theory because of the translation-rotation energy. The present thermodynamic theory is identical to that suggested by Rodebush (and implied by Frenkel and Reed) but the 10 to the 20th power disparity has remained unnoticed. The differences between the present and recent theories arise from different approaches to the energy of the 3ng-6 vibration modes in a cluster and specifically the energies of the 6 non-appearing modes. A complete omission of these 6 energies gives the present 10 to the 20th power factor, an omission of the zero-point energies of the 6 modes gives the Lothe-Pound 10 to the 17th power factor, and inclusion of the zero-point energies gives a .0001 - 10 to the 10th power factor (the Kuhrt theory). (Author)

AD-621 262 Div. 4/4 ,25/8
KANSAS UNIV LAWRENCE DEPT OF CHEMISTRY
COMPARISON OF THEORIES OF HEAT OF TRANSPORT AND THERMAL DIFFUSION WITH EXPERIMENTS ON THE CYCLOHEXANE-CARBON TETRACHLORIDE SYSTEM,
by Richard J. Bearman, and Frederick H. Horne. 27 Jul 64, 8p. Contract AF AFOSR376 63 Task 18AFOSR ,1965-1258
AFOSR,
Unclassified report

Pub. in The Journal of Chemical Physics v42 n6 p2015-9 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cyclohexanes, Thermal properties), (*Carbon tetrachloride, Thermal properties), (*Heat transfer, Theory), (*Thermal diffusion, Theory), Solutions, Thermodynamics, Experimental data

Theories of the heat of transport and the related thermal diffusion factor have been developed previously. The theories are compared with experimental results. Both theories represent adequate first approximations since they both predict the sign and magnitude of the experimental results without adjustment to experimental transport data. (Author)

AD-621 266 Div. 4/4
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
STUDY OF THE HYDROLYSIS EQUILIBRIA OF CATIONS BY EMF METHODS,
by George Biedermann. 1964, 23p. Contract AF EOAR8 63
AFOSR , 65-1247
Unclassified report

Pub. in Svensk Kemisk Tidskrift v76 n4 p1-23 1964 (Copies available only to DDC users).

Descriptors: (*Hydrolysis, Chemical equilibrium), (*Chemical equilibrium, Electrochemistry), Voltage, Solutions, Ions, Electrolytic cells, Acid-base reactions, Electrodes, Sweden

The survey gives a short account of the experimental and interpretational problems encountered when the composition of the products of ionic reactions, especially those of hydrolysis, are to be ascertained on the basis of emf measurements.

AD-621 267 See Fld. 7/2

AD-621 282 See Fld. 7/2

AD-621 283 See Fld. 7/2

AD-621 297 See Fld. 20/12

AD-621 306 See Fld. 11/9

AD-621 315 Div. 4/4 ,25/4
WASHINGTON STATE UNIV PULLMAN
PHOTODESORPTION,
by R. O. Adams, and E. E. Donaldson. 12 Jun 64, 8p. Contract AF AFOSR62 86
AFOSR , 65-1216
Unclassified report

Pub. in The Journal of Chemical Physics v42 n2 p770-4 15 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Iron, Degasification), (*Nickel, Degasification), (*Zirconium, Degasification), (*Photons, Degasification), Carbon compounds, Monoxides, Surfaces, Purification, Effectiveness, Adsorption

Monochromatic radiation with a wavelength between 2000 and 6000 A is shown to desorb CO from surfaces of Fe, Ni, and Zr. The desorption efficiency has a maximum at 2700 A for Ni, at less than 2500 A for Zr, and in the visible region for Fe. Photodesorption from W and Mo was not detected. A suggested mechanism for photodesorption indicates that valuable information concerning surface binding can be obtained from refined measurements. (Author)

AD-621 450 Div. 4/4
GENERAL ELECTRIC RESEARCH LAB SCHENECTADY N Y
CHEMISORPTION ON SOLIDS,
by Gert Ehrlich. 1965, 41p. Rept. no. reprint-4993
Contract AF49 638 1362
AFOSR . 65-1451
Unclassified report

Pub. in Proceedings of the International Congress on Catalysis (3rd), Amsterdam, 20-25 Jul 1964. (Copies available only to DDC users).

Descriptors: (*Chemisorption, Reviews), (*Catalysis, Chemisorption), Solids, Gases, Theory, Chemical bonds, Atomic orbitals, Work functions, Surface properties, Nitrogen, Tungsten, Carbon compounds, Monoxides

Progress in the understanding of chemisorption phenomena involving molecular gases on solids is reviewed, with particular emphasis on two topics: (1) The theoretical foundations and their failings and (2) Experimental studies of structural effects. (Author)

AD-621 461 **See Fld. 20/2**

AD-621 469 Div. 4/4 ,4/3
ROCHESTER UNIV N Y DEPT OF CHEMISTRY
THE FLUORESCENCE OF BENZENE AND BENZENE-D6,
by John A. Poole. 4 Nov 64, 7p. Contract AF AFOSR206 63 Proj. 9760 Task 976002
AFOSR . 65-1256
Unclassified report

Pub. in the Journal of Physical Chemistry v69 n4 p1343-7 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Aromatic compounds, Fluorescence), (*Fluorescence, Aromatic compounds), Photochemistry, Excitation, Electron transitions

A study has been made of the quantum yields of fluorescence of benzene and benzene-d6 in the pressure range 5-15 mm. and at the temperatures 30, 60, and 90 degrees. The exciting lines were monochromatically chosen to correspond to the transition 1A (1g) to 1B (2u). The yields for benzene-d (6) exceeded those for benzene in all cases. The Stern-Volmer plots showed a small but finite slope, and the addition of 80 mm. of cyclophexane resulted in a decrease in fluorescence yield except in the case of benzene at 30 degrees where no such decrease was observed. The high values for the emission yields of biacetyl, sensitized by the benzenes, at 30 degrees substantiates the hypothesis that the primary process involving 1B (2u) removal is intersystem crossing to the 3B (1u) state. The energy required for this process is about twice the difference in zero point energies for benzene-d (6). Thus, intersystem crossing seems to depend upon vibrational energy content. The fluorescence yields decreased with increasing temperature and decreasing wave length of the exciting line. The nonradiative process involving intersystem crossing appears to be faster for the light benzene. (Author)

AD-621 472 **See Fld. 7/3**

AD-621 506 **See Fld. 21/9**

AD-621 589 Div. 4/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
NATIONAL BUREAU OF STANDARDS WASHINGTON D C HEAT DIV
PARAMAGNETIC RESONANCE.
Status rept. for 1 Jul-30 Sep 65,
by Harrison E. Radford. 30 Sep 65, 5p. Contract NAonr12 65 Proj. NR018 405
Unclassified report

Descriptors: (*Paramagnetic resonance, Atomic spectroscopy), Nitrogen, Oxygen, Dischagre tubes, Free radicals

Paramagnetic resonance studies in nitrogen and oxygen are summarized.

AD-621 596 **See Fld. 7/3**

AD-621 608 **See Fld. 7/3**

AD-621 609 **See Fld. 7/3**

8/2. CARTOGRAPHY

AD-621 046 Div. 2/4 ,8/6 ,25/4
CFSTI Prices: HC $3.00 MF $0.75
BARKLEY AND DEXTER LABS INC FITCHBURG MASS
A STUDY OF GEODETIC TECHNIQUES.
Final rept. for 1962-Dec 63,
by Raymond B. Wilson,Jr., Dec 63, 87p. Contract AF19 604 8852 Proj. 7600 Task 760006
AFCRL . 65-102
Unclassified report

See also AD-609 759.

Descriptors: (*Geodesics, Distance-measuring equipment), (*Distance-measuring equipment, Geodesics), (*Light, Propagation), (*Radio waves, Propagation), Atmospherics, Microwaves, Extremely low frequency, Very low frequency, Wave transmission, Atmospheric refraction, Refractive index, Scattering, Reflection, Multipath transmission

Studies of the geodetic potential of measuring systems employing light, microwaves, very low frequency and extra low frequency radio waves are given with emphasis on the type of measurement each system is best suited for. A summary of the accuracies possible with a sample system gives an idea of the design considerations necessary in that part of the spectrum. A section on transmitting media outlines the fundamentals of atmospherics encountered in each part of the spectrum, and suggestions for elimination of errors due to atmospherics are given. Sample techniques presently employed in geodetic systems are given to illustrate the use of these techniques and to illustrate the source of errors in each technique. Reports of mathematical investigations and field tests undertaken during this contract and the subsequent results of these projects are given. These projects are evaluation reports of existing or experimental equipment and their use may apply to more than one section of the frequency spectrum and are presented under a separate section. (Author)

AD-621 086 **See Fld. 9/2**

AD-621 356 **See Fld. 3/1**

AD-621 534 Div. 2/2
CFSTI Prices: HC $5.00 MF $1.00
OHIO STATE UNIV COLUMBUS
A UNIFIED PLANE COORDINATE REFERENCE SYSTEM.
Doctoral thesis,
by Alden P. Colvocoresses. 1965, 169p.
Unclassified report

Descriptors: (*Mapping, Instrumentation), Map projection, Geodesics, Theory

AD-621 588 Div. 2/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS
A METHOD OF BLOCK ADJUSTMENT FOR HEIGHTS WITH RESULTS OBTAINED IN THE INTERNATIONAL TEST,
by G. H. Schut. 2 Feb 65, 17p. Rept. no. NRC-7907
Unclassified report

Pub. in Photogrammetria v20 p35-51 1965 (Copies available only to DDC users).

Descriptors: (*Photogrammetry, Height finding), (*Height finding, Photogrammetry), Aerial photographs, Correlation techniques, Stereoscopic height finding, Stereoscopic map plotters, Polynomials, Transformations (Mathematics), Mapping, Programming (Computers)

This paper describes a method of block adjustment for heights, programmed at the National Research Council. The method consists in polynomial transformation of strips and includes corrections for height curvature and for torsion. For the computation of the transformation formulas, a direct solution of the system of normal equations is employed. The program is used in combination with a program for three-dimensional strip adjustment and a program for planimetric block adjustment which utilize conformal transformations. The program has been used in the height adjustment for the International Test on Block Adjustment. For each of the three sets of measurements made at the N.R.C., several adjustments have been performed with various degrees of the polynomials. The results are listed in tables and analyzed. For the 1 : 80,000 photography, the mean square values of the residuals at ground-control points range from 3.8 to 7.2 m. (Author)

AD-621 597 Div. 2/4 ,32/6
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED PHYSICS
CLOSING REMARKS TO THE DISCUSSION LEGAL SURVEYS AND ACCURACY SPECIFICATIONS,
by T. J. Blachut. 1965, 4p. Rept. no. NRC-8493
Unclassified report

Pub. in the Canadian Surveyor, v19 n2 p119-22 Jun 1965 (Copies available only to DDC users).

Descriptors: (*Surveying, Specifications), Law, Standards, Costs, Canada

The question of legal surveying and the necessary accuracy of surveys of property in various locations and of various values is discussed.

8/6. GEOGRAPHY

AD-620 880 Div. 2/5
CFSTI Prices: HC $2.00 MF $0.50
NAVY ELECTRONICS LAB SAN DIEGO CALIF
ICE GLOSSARY,
by R. J. Boyle. 10 Jun 65, 46p.
Unclassified report

Descriptors: (*Ice, Dictionaries), Glaciers, Permafrost, Geology, Arctic regions, Vocabulary

The glossary presented here is not intended as a final or complete compilation. It does, however, provide a fairly comprehensive list of the generally accepted terminology of glaciology, arctic geology, and arctic operations. It has been prepared with the special needs of the submariner in mind, and is derived in part from two glossaries published by the Scott Polar Research Institute.

AD-621 041 Div. 2/5
CFSTI Prices: HC $6.00 MF $1.50
ARMY COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER N H

BIBLIOGRAPHY ON SNOW, ICE AND PERMAFROST WITH ABSTRACTS. VOLUME XIX.
Jun 65, 292p. Rept. no. CRREL-12
Unclassified report

See also PB 167 417.

Descriptors: (*Snow, Bibliographies), (*Ice, Bibliographies), (*Permafrost, Bibliographies), Cold weather tests, Polar regions, Civil engineering, Geophysics, Meteorology, Climatology, Abstracting

The Bibliography provides a current and comprehensive coverage of basic and applied scientific research on snow, ice, and permafrost, as well as living and working in polar regions and other cold areas. Each entry includes a bibliographic citation, code designating the library holding of the abstracted item, assigned call number, Universal Decimal Classification number, and the abstract. This volume has a geographic index which was included as a forerunner to future editions contingent on the value derived.

AD-621 327 See Fld. 5/10

8/7. GEOLOGY AND MINERALOGY

AD-621 365 Div. 2/8
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
DIRECT OBSERVATION OF DISLOCATIONS AND PLASTICITY IN MINERAL CRYSTALS WITH SPECIAL REFERENCE TO PLAGIOCLASE.
Special reports,
by K. E. Seifert. Jul 65, 45p. Rept. no. AFCRL-65-502 ,SR-29
Proj. 8623 Task 862301
Unclassified report

Descriptors: (*Minerals, Plasticity), (*Crystal lattice defects, Minerals), (*Feldspar, Plasticity), Crystals, Deformation, Single crystals

The AFCRL mineral study determines deformational behavior in important rock-forming minerals as a function of their internal and external environment. Internal perfection of crystals is being determined by chemical analysis, thermoluminescence, optics, X-ray studies and by use of etching and the electron microscope to study dislocation density and pattern. External environment is being determined by experimentally deforming crystals under known conditions of temperature, pressure, rate of strain and total strain. In this manner crystal deformation can be used to help interpret the previous history of these minerals either singularly or as mixtures in rocks. Previous studies involving the application of the etch-pit method to minerals and the influence of dislocations on plasticity are reviewed. In particular the relationship of dislocations to twin gliding and translation gliding is discussed, with special reference to plagioclase. (Author)

AD-621 438 See Fld. 13/2

8/9. MINING ENGINEERING

AD-620 968 See Fld. 20/2

AD-621 600 Div. 17/1 ,17/5
ATLANTIC REGIONAL LAB HALIFAX (NOVA SCOTIA)
KINETICS OF DESULPHURIZATION OF LIQUID IRONSULPHUR ALLOYS BY MIXTURES OF HYDROGEN WITH HELIUM AND ARGON,
by R. J. W. Peters, C. R. Masson, and S. G. Whiteway. 26 Jan 65, 10p.
NRC , 8579
Unclassified report

Pub. in Transactions of the Faraday Society, v61 n512 pt8 p1745-53 Aug 1965. (Copies available only to DDC users).

Descriptors: (*Sulfur, Refining (Metallurgy)), (*Iron alloys, Refining (Metallurgy)), (*Refining (Metallurgy), Iron alloys), Liquids, Mixtures, Hydrogen, Helium, Argon, Gases, Canada

Iron-sulphur alloys which contained up to 3.5% sulphur were desulphurized at 1545C by gas mixtures which contained 2-100% hydrogen along with argon and/or helium as diluents. The rate of the reaction was measured by observing the rate of production of hydrogen sulphide. The results indicated that equilibrium between hydrogen, sulphur and hydrogen sulphide was established at the gas-metal interface and that the rate was controlled by diffusion of H2S away from the interface. The Reynolds number of the gas directed at the surface of the melt was important in determining the flux of H2S, and kinetic expressions were derived which were in good agreement with the main observations. (Author)

8/10. PHYSICAL OCEANOGRAPHY

AD-620 873 Div. 2/9 ,9/4
CFSTI Prices: HC $3.00 MF $0.50
ARMY COASTAL ENGINEERING RESEARCH CENTER WASHINGTON D C
SOURCE AND DISTRIBUTION OF SEDIMENTS AT BRUNSWICK HARBOR AND VICINITY, GEORGIA.
Technical memo.,
by James Neiheisel. Mar 65, 56p. Rept. no. TM-12
Unclassified report

Descriptors: (*Marine geology, Georgia), (*Sedimentation, Harbors), Atlantic Ocean, Seacoast, Ocean currents, River currents, Transport properties, Silt, Hydrodynamics, Hydrology, Civil engineering

The distribution patterns of bottom sediment in Brunswick Harbor and vicinity, Georgia, reflect the long-term hydrodynamic response and generally correlate with dynamic factors affecting sedimentation. Certain diagnostic minerals reflect the source area and are used as 'natural tracers' to delineate direction of sediment movement. Analysis of sedimentary parameters also enables interpretation of direction of sediment transport. The results of this investigation indicate that shoaling presently occurring in Brunswick Harbor is related to materials from a source in the Altamaha River. Sediment contribution to shoaling is introduced into the harbor through the tidal inlet between the barrier islands and from the MacKay River during greater than average discharge rates of the Altamaha River. Shoaling rates in the harbor also correlate with discharge rates of the Altamaha River. This investigation demonstrates the value of sediment interpretation, based on knowledge of regional geology, to provide a basis for analysis of sediment movement in a coastal area. In such a complex coastal area as Brunswick, Georgia, the sediment characteristics augment hydraulic measurements and enable a more complete interpretation of the hydrodynamics involved. Such information has application to engineering design of coastal structures. (Author)

AD-620 875 Div. 2/9
CFSTI Prices: HC $1.00
NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C
REPORT OF THE ARCTIC ICE OBSERVING AND FORECASTING PROGRAM, 1963.
Special publication.
May 65, 188p. Rept. no. SP-70 (63)
Unclassified report

Available from Naval Oceanographic Office, Washington, D. C., 20390, $2.10.

Descriptors: (*Ice, Arctic regions), (*Oceanology, Ice), Meteorology, Climatology, Weather forecasting, Ice islands, Navigation charts

A summary of NAVOCEANO and Danish ice operations during 1963 is presented. Operational aspects of obtaining and disseminating ice information and the ice forecasting and observing program are discussed. Ice charts depict observed synoptic ice conditions throughout the year. Locations of oceanographic stations occupied in the polar and subpolar regions are included. (Author)

AD-621 248 See Fld. 13/2

AD-621 336 Div. 2/9 ,9/1
CFSTI Prices: HC $1.00 MF $0.50
NAVY UNDERWATER SOUND LAB NEW LONDON CONN
A GENERAL INTRODUCTION TO THE INTERNAL WAVES OF THE OCEAN.
Research rept.,
by Harold J. Doebler. 13 Sep 65, 23p. Rept. no. USL-696
Proj. SR104 03 01 587
Unclassified report

Descriptors: (*Oceanology, Bathythermograph data), (*Ocean waves, Underwater), (*Bathythermograph data, Ocean waves), Marine geophysics, Hydrodynamics, Salinity, Temperature, Boundary layer, Oscillation, Propagation, Acoustics, Hydrographic surveying

Internal waves are cyclic depth oscillations of a density boundary within the volume of the medium. The effects of these waves in the ocean have been observed in both the propagation of underwater sound and hydrographic station data. This report reviews some of the technical literature with the intent of presenting and describing, in a simplified way, the characteristics of the internal waves of the ocean. Wave propagation velocities, lengths, and periods will be discussed, as well as some of the other factors of their occurrence. (Author)

AD-621 367 See Fld. 4/2

AD-621 369 Div. 2/9 ,2/7
CFSTI Prices: HC $1.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
NOTE ON THE EFFECT OF NON-LINEAR ACCELERATIONS IN THE OCEANIC EKMAN LAYER.
Technical rept.,
by Pierre Welander. Sep 65, 11p. Rept. no. reference no. 65-49
Contract Nonr219600 Proj. NR083 004
Unclassified report

Descriptors: (*Marine geophysics, Ocean currents), (*Ocean currents, Coriolis effect), (*Coriolis effect, Ocean currents), Wind, Boundary layer, Oceans, Transport properties, Acceleration

It is shown theoretically that the concept of an Ekman layer in the wind-driven oceanic circulation is no longer valid when the layer gets thin, and non-linear acceleration terms must be considered. The corrections may be noticeable in local regions of the ocean with strong wind gradient. (Author)

AD-621 459 See Fld. 8/14

AD-621 564 Div. 2/9 ,7/2 ,31/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
LOAD-CARRYING TERMINALS FOR ARMORED ELECTRIC CABLES.
Final interim rept.,
by E. C. Crul, and J. J. Gennari. 31 Aug 65, 22p.

Rept. no. NRL-6261
Proj. SF001 03 20 8057

Unclassified report

Descriptors: (*Oceanographic equipment, Towing cables), (*Electric cables, Oceanographic equipment), (*Cables (Mechanical), Oceanographic equipment), Underwater equipment, Electric connectors, Cable grips, Couplings, Encapsulation, Epoxy plastics, Mechanical properties, Tests

Four load-carrying terminals, or sockets, for use with armored electric tow cables, have been designed, developed, and tested at NRL. Two of these designs are mechanically assembled, and two are potted, or cast. In the mechanically assembled design, the attachment of the socket to the load-carrying wires is achieved by mechanically gripping the armor wires between force-fitted friction surfaces. The potted designs use a low-melt-temperature alloy or an epoxy compound which intimately flow about the armor wires. After hardening, the socket is ready for use. The mechanically assembled socket can develop more than 95 percent of the full cable strength before failing; it has been field tested satisfactorily. However, of all the NRL socket types discussed, the authors' preference is for the low-melt-alloy potted type. This type socket has been used at sea for more than a year with good results. The major advantage of this type socket is the ease and speed with which it can be replaced by field workers. (Author)

AD-621 621 Div. 2/9
NARRAGANSETT MARINE LAB UNIV OF RHODE ISLAND KINGSTON
THE WINTER-SPRING DIATOM FLOWERING IN NARRAGANSETT BAY.
Technical rept.,
by David M. Pratt. Aug 65, 16p. Rept. no. TR-1
Contract Nonr39603 Proj. NR104 100

Unclassified report

Pub. in Limnology and Oceanography v10 n2 p17384 Apr 1965 (Copies not available to DDC or Clearinghouse customers) Rept. on Biological Productivity Proj.

Descriptors: (*Marine biology, Narragansett Bay), (*Narragansett Bay, Marine biology), Plants (Botany), Plankton, Phosphates, Nitrates, Silicates, Growth, Climatology, Oceanographic data, Ecology

Weekly observations of phosphate, nitrate, silicate, and phytoplankton over a 4 1/2-year period are analyzed to explain year-to-year variations in the time of inception and magnitude of the winter-spring diatom flowering in Narragansett Bay, Rhode Island. The population during this period (November-June) is dominated by Skeletonema costatum. The start of growth does not appear to be related to stability, temperature, or incident radiation; Martin (1965) has shown that it is triggered by the release of zooplankton grazing pressure. The diatom maximum is independent of temperature and incident radiation, and it is regulated by the concentrations of nitrate and silicate at the beginning of logarithmic growth, which also influences the magnitude of that part of the flowering that follows the winter maximum. In most years, considerable growth takes place after the exhaustion of nitrate, whereas growth was never observed to continue after silicate depletion. The relative importance and interplay of silicate and nitrogen as limiting factors are discussed. Since the flowering is greater the earlier it begins, its success is to some degree predetermined by zooplankton activity in the fall. (Author)

AD-621 622 Div. 2/9
NARRAGANSETT MARINE LAB UNIV OF RHODE ISLAND KINGSTON
PHYTOPLANKTON-ZOOPLANKTON RELATIONSHIPS IN NARRAGANSETT BAY.
Technical rept.,
by John H. Martin. Aug 65, 11p. Rept. no. TR-8
Contract Nonr39603 Proj. NR104 100

Unclassified report

Pub. in Limnology and Oceanography v10 n2 p185-91 Apr 1965 (Copies not available to DDC or Clearinghouse customers). Rept. on Biological Productivity Proj.

Descriptors: (*Marine biology, Narragansett Bay), (*Narragansett Bay, Marine biology), (*Plankton, Narragansett Bay), Plants (Botany), Nitrates, Phosphates, Silicates, Nutrition, Aquatic animals, Ecology

Zooplankton samples collected every other week in upper and lower Narragansett Bay, Rhode Island, were analyzed quantitatively and qualitatively. The seasonal occurrence and abundance of the various species identified and enumerated in the present study are presented in tabular form. Analysis of the relative abundance of the principal grazers in the zooplankton population (Acartia tonsa, A. clausi, and Oithona spp.) and of the dominant phytoplankton species, Skeletonema costatum, upon which these copepods are believed to graze preferentially, shows that the seasonal changes in phytoplankton abundance are to a considerable extent attributable to differential grazing pressures. Concentrations of plant nutrients (nitrate, phosphate, and silicate) were compared with zooplankton numbers. It is believed that the large summer-fall zooplankton population contributes to the phosphate maximum and possible indirectly to the nitrate maximum as well. (Author)

8/11. SEISMOLOGY

AD-621 224 Div. 2/10
CFSTI Prices: HC $2.00 MF $0.50
GEOTECHNICAL CORP GARLAND TEX
STUDY OF SHORT-PERIOD SEISMIC NOISE.
Semiannual technical summary rept. no. 6, 1 Jan30 Jun 65,
by E. J. Douze, and Herbert Robertson. 2 Aug 65, 40p. Rept. no. TR-65-77
Contract AF49 638 1150 Proj. arpa order 292 62 292 63

Unclassified report

Descriptors: (*Seismology, Microseisms), Background, Noise, Seismic waves, Seismographs, Statistical analysis

This report describes work on short-period seismic noise, signals, and signal-to-noise ratios. It includes: (1) a section on statistical measurements of noise and some sampling techniques in use, (2) a section on visual and spectral techniques that were used to detect body waves in the short-period noise recorded by a deep-hole array at Grapevine, Texas, (3) a section on a filtered narrow-band seismograph that was designed to reduce noise outside the band of maximum signal information at Las Cruces, New Mexico, and (4) a section on higher-mode Rayleigh waves as recorded by deep-hole seismographs at Fort Stockton, Texas. (Author)

AD-621 232 Div. 2/10
SAINT LOUIS UNIV MO INST OF TECH
EFFECT OF SEDIMENTARY THICKNESS ON SHORTPERIOD RAYLEIGH-WAVE DISPERSION.
Scientific rept. on Proj. VELA-UNIFORM,
by T. V. McEvilly, and William Stauder. 12 Aug 64, 12p. Rept. no. SR-11 ,Pub-138
Contract AF19 604 7399 Proj. 8652 ,ARPA Order 292 Task 865201 ,2
AFCRL , 65-500

Unclassified report

Pub. in Geophysics v30 n2 p198-203 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Seismology, Underground explosions), (*Seismic waves, Propagation), Sedimentary rock, Explosion effects, Geophysical prospecting, Earthquakes

Large differences in group velocities of short-period Rayleigh waves from stripmine blasts for different propagation paths in the Ozark Uplift-Illinois Basin area have been observed. Good well control in the area makes possible the construction of structural models of the sediments-basement system for these paths. Theoretical group velocities computed for these models agree well with observations, thus explaining the large variations in velocities in terms of basementdepth differences. This sensitivity of short-period surface waves to sedimentary thickness suggests an inexpensive, single-station technique of basin reconnaissance where commercial blasting is available. (Author)

AD-621 363 Div. 2/10 ,13/4
CFSTI Prices: HC $3.00 MF $0.75
WEIDLINGER (PAUL) NEW YORK
STEP LOAD MOVING WITH SUPERSEISMIC VELOCITY ON THE SURFACE OF A HALF-SPACE OF GRANULAR MATERIAL.
Technical rept. for Jul 63-Mar 65,
by Hans H. Bleich, Alva Matthews, and Joseph P. Wright. Sep 65, 87p. Contract AF29 601 6055 Proj. 5710 Task 13 144
WL , TR-65-59

Unclassified report

See also AD-405 153.

Descriptors: (*Underground structures, Soil mechanics), (*Wave transmission, Soils), (*Seismic waves, Propagation), Elasticity, Friction, Load distribution, Numerical analysis, Surfaces

The two dimensional steady-state problem of the effect of a step pressure traveling with superseismic velocity on the surface of a half-space is treated for an elasticplastic material. The plasticity condition selected is suitable for a granular medium where inelastic deformations are due to internal slip subject to coulomb friction. The problem is inherently nonlinear and leads to a system of coupled differential equations which are solved by digital computer. Numerical solutions are tabulated as functions of the significant nondimensional parameters, i.e. of the Mach number, Poisson's ratio and of a value alpha defining the internal friction. (Author)

8/14. TERRESTRIAL MAGNETISM

AD-621 044 Div. 2/6
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A CHEBYSHEV APPROXIMATION TO THE EARTH'S EXTERNAL GRAVIPOTENTIAL WITH INTERNALLY UNRESTRICTED MASS DISTRIBUTION,
by M. L. Juncosa, and R. K. C. Johns. Sep 65, 34p. Rept. no. RM-4677-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Gravity, Potential theory), (*Polynomials, Linear programming), Series, Harmonic analysis, Geophysics, Numerical analysis, Numerical methods and procedures

The global external gravitational potential is developed in a series of polynomials of direction cosines and inverse powers of the radius closely related to an expansion of the potential in spherical harmonics. The Chebyshev fitting criterion is used to obtain the coefficients in several sets of approximations. To various (up to nearly six) numbers of significant figures, these approximations agree with comparable customary expansions in zonal and tesseral harmonics whose coefficients are usually obtained with the less stringent least-squares criterion, but they contain fewer coefficients. Chebyshev linear fitting problems are equivalent to linear programming problems for which many routines already exist for use on electronic digital computers. The use of fewer coefficients and simpler functions in the expansion yields computational advantages. Because the internal mass distributions producing identical external potentials are not necessarily unique, no assumptions on the internal mass structure are made. (Author)

AD-621 233 See Fld. 4/2

AD-621 279 Div. 2/6
CFSTI Prices: HC $1.00 MF $0.50
JOHNS HOPKINS UNIV SILVER SPRING MD APPLIED PHYSICS LAB
A STUDY OF THE RESONANCE EFFECTS DUE TO THE EARTH'S POTENTIAL FUNCTION.
Technical memo.,
by S. M. Yionoulis. Jul 65, 25p. Rept. no. TG-708
Contract NOw62 0604c
Unclassified report

Descriptors: (*Geodesics, Potential theory), (*Resonance, Geophysics), (*Potential theory, Geodesics), (*Earth, Potential theory), Satellites (Artificial), Orbital trajectories, Celestial mechanics, Harmonic analysis

This paper presents a detailed description of the resonance effects due to the earth's potential. Equations are presented which enable the reader to determine which harmonics in the geopotential expansion will contain near-resonant contributions for a given satellite orbit. Coefficients associated with the harmonics of degree and order (n,m) = (13,13), (14,14), and (15,14) are found. (Author)

AD-621 314 See Fld. 4/2

AD-621 459 Div. 2/6 ,2/9
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
ON THE SMALL AMPLITUDE OF MAGNETIC SECULAR CHANGE IN THE PACIFIC AREA,
by E. H. Vestine, and Anne B. Kahle. Aug 65, 12p. Rept. no. P-3215
Unclassified report

Descriptors: (*Terrestrial magnetism, Pacific Ocean), (*Marine geophysics, Terrestrial magnetism), Magnetic fields, Oscillation, Geophysics, Geology, Oceanology

It has been suggested that toroidal fields in the earth's fluid metallic core are brought to the surface to provide changes with time in the geomagnetic field. The centers of secular change thereby produced then drift slowly westward. If there is a downflow of fluid the secular change pattern may then be reduced in intensity relative to those regions experiencing an upflow. Data on the geomagnetic field (1912-1955) are used to show that such a downflow is probable in the Pacific region. This may provide an unforced explanation for the small amplitude in secular change long observed in the Pacific. (Author)

9/1. COMPONENTS

AD-620 852 See Fld. 17/9

AD-620 853 Div. 8/4
CFSTI Prices: HC $2.00 MF $0.50
MICROWAVE ELECTRONICS CORP PALO ALTO CALIF
ONE WATT CW S-BAND TRAVELING WAVE TUBE WITH 6 DB NOISE FIGURE.
Interim rept. no. 2, Sep-Dec 63.
Aug 65, 26p. Contract AF30 602 3025 Proj. 5573 Task 557301
RADC , TR-64-535
Unclassified report

See also AD-428 056.

Descriptors: (*Traveling wave tubes, S band), Cathodes (Electron tubes), Performance (Engineering), Electron guns, Nickel alloys, Oxides, Helixes, Oxide cathodes, Noise (Radar), Life expectancy, Gain, Noltage, Radiofrequency power

Objectives during this period were to evaluate Cathaloy A-33 as a cathode base material, find the effect of cathode activation and processing on noise figure, and make preliminary electron-gun evaluations at high current densities. Cathaloy A-33 exhibited excellent characteristics up to 900 hours life; however, it does not appear to be superior to 220 Ni. Analysis of the effect of proper activation and processing of the cathode was started but not completed. More test vehicles are needed for proper evaluation. Tests on a low-voltage input helix were encouraging and a velocity taper on the output helix improved the saturated power output. An electron gun was scaled, utilizing the current density and voltage from a previous model, and the gun structure changed to allow closer spacing between electrodes. This gun is being fabricated and has not been tested. (Author)

AD-620 854 Div. 8/2 ,25/1
CFSTI Prices: HC $3.00 MF $0.75
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
ACTIVE ACOUSTIC DEVICES.
Quarterly rept. no. 3, Jan-31 Mar 65,
by N. G. Sakiotis, W. H. Brendecke, and F. S. Hickernell. Aug 65, 78p. Contract AF30 602 3478 Proj. 5578 Task 557802
RADC , TR-65-203
Unclassified report

See also AD-612 703.

Descriptors: (*Transducers, Semiconductor devices), (*Acoustic equipment, Semiconductor devices), (*Semiconductor devices, Transducers), Semiconducting films, Cadmium compounds, Sulfides, Piezoelectric crystals, Solid state physics, Vapor plating, Vacuum, Gain, Beryllium compounds, Oxides, Quartz, Very high frequency, Surface properties, Amplifiers, Thermal conductivity, Ultrasonic properties

A heat sink design has been demonstrated which maintains the maximum crystal temperature rise to less than 10 C above ambient for a range of values of drift field power density required for useful continuous acoustic gain. The work on thin film transducers has yielded processes and techniques for the deposition of insulating CdS films on CdS substrates resulting in conversion losses in the range of 6-8 db and bandwidths of the order of 50% in the frequency of 100-300 mc/sec. Bonded quartz transducers operating in the first overtone mode at 180 mc/sec with conversion losses of less than 10 db were demonstrated. Acoustic amplifier utilizing CdS material was shown to operate satisfactorily at maximum crystal temperatures of at least 70 C. (Author)

AD-620 855 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR DISPLACING A BEAM ALONG A GIVEN TRAJECTORY IN INSTALLATIONS FOR CATHODE RAY PROCESSING,
by A. F. Korotkov. 19 Aug 65, 6p. Rept. no. FTD-TT-65-497
TT , 65-63875
Unclassified report

Unedited rough draft trans. of Russian patent 167 135, pub. 23 Apr 63, appl. 833560/25-8, 2p.

Descriptors: (*Cathode ray tubes, Delay lines), (*Delay lines, Cascade structures), Electron tubes, Patents, USSR

Object of the invention: Device for displacing beam along a given trajectory in installations for cathode ray processing, containing a beam scanning block along a closed trajectory, characterized by the fact, that for the purpose of assuring synchronous and cophasal with the scanning beam control at any given rate of its displacement, into the block of scanning the beam along a closed trajectory is introduced a block controlling the double cascade delay system. (Author)

AD-620 857 See Fld. 6/12

AD-620 870 See Fld. 4/2

AD-620 890 See Fld. 20/12

AD-620 907 Div. 8/2
CFSTI Prices: HC $4.00 MF $0.75
GENERAL DYNAMICS/ELECTRONICS ROCHESTER N Y RADIO COMMUNICATIONS LAB
INTEGRATED PRECISION TUNING SYSTEM.
Rept. no. 10 (Final), 14 Sep 61-1 Apr 65,
by Gabriel J. Luhowy. 1 Apr 65, 101p. Contract DA36 039sc88908 Proj. 1P6 22001A057
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Tuning devices, Radiofrequency amplifiers), (*Radio receivers, Tuning devices), (*Miniature electronic equipment, Tuning devices), Tuned circuits, High frequency, Portable, Single sideband communication systems, Distortion, Modulation, Variable capacitors, Voltage, Transistor amplifiers, Noise (Radio), Phaselocked systems, Mixers (Electronic)

A brief history of the Precision Integrated Tuner program from its inception to date is given. Some of the more interesting highlights in the evolution of the final design are presented, including a brief outline of the factual data to be presented. A summary of design considerations which affect the relative importance of tuner performance characteristics is discussed. The summary is written with emphasis on speech communications equipment in the HF range, particularly single sideband manpack communications equipment. Because of the advanced development nature of the program, economic considerations which might considerably affect certain performance trade-offs are given littel emphasis. Data is presented on the following topics: distortion in forward biased junction diodes, distortion in reverse biased junction diodes-the VVC, junction transistor RF amplifiers, voltage tuned RF tuner design, and test data from the final development models.

AD-620 914 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
OXIDE MASKED EPITAXIAL FIELD EFFECT TRANSISTORS.
Final rept. for 19 Apr 63-31 Aug 64,
by Brian Dale, Marvin Miller, Roy Yee, and StanleyKarandanis. Jul 65, 94p. Contract AF30 602 3048 Proj. 5578 Task 557804
RADC , TDR-64-498
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Transistors, Epitaxial growth), Oxides, Silicon, Semiconducting films, Microminiaturization (Electronics), Integrated circuits, Transistor amplifiers

The report describes work performed in developing a unipolar field effect transistor in which the channel is in a thin film of silicon epitaxially grown on silicon of the opposite polarity type. Fabrication was performed of units in which the channels were grown within windows in a surface oxide film, and also units in which the channel layer was grown over the entire slice and an oxide-masked diffusion then used to isolate and localize channel regions of the individual units. Techniques involved in the areas of fabrication process, and the relationship of these calculated distributions to the actual distributions in the devices is discussed. Characteristics of devices resulting from both methods of fabrication are reported. Using results of the investigation and fabrication of discrete FET's, an integrated operational amplifier circuit

using these unipolar field effect devices as well as NPN and PNP bipolar transistors was designed, and fabrication of devices was begun. (Author)

AD-620 917 Div. 8/4
CFSTI Prices: HC $4.00 MF $1.00
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
THE DESIGN AND DEVELOPMENT OF A FIVE WATT NUVISTOR TRIODE.
Final development rept. for 24 Jun 63-24 Mar 65,
by R. K. Reusch. 24 Mar 65, 146p. Contract NObsr81478

Unclassified report

Descriptors: (*Triodes, Ultrahigh frequency), (*Power amplifiers, Triodes), (*Frequency multipliers, Triodes), (*Microwave oscillators, Triodes), Microwave amplifiers, Electron tube heaters, Electrodes, Molybdenum, Cathodes (Electron tubes), Anodes (Electron tubes), Manufacturing methods, Brazing, Aging (Materials), Life expectancy

The report covers the design and development of two nuvistor triodes having a plate dissipation capability of 5-6 watts. The two developmental types are identical in electrical characteristics but differ in envelope and terminal construction. One version, the A15512A, has a coaxial cathode terminal and the other, the A15526, has a leaded base similar to conventional nuvistors. Both types are designed for application on pulsed or cw Class C amplifiers, oscillators, or frequency multipliers at frequencies up to 1.2 Gc/s. Power output of a cw amplifier at 1.2 Gc/s with a plate input of 10 watts is about 4.4 watts. Under pulsed amplifier operation at 1.0 Gc/s, 0.025 duty factor, 5 micro sec. pulse duration, and 4.8 watts average plate input power, the peak output power is about 105 watts. Both types have an amplification factor of 100 and a transconductance of 19,000 micro mhos at a plate voltage of 200 volts, a plate current of 15.5 ma., and a cathode resistance of 68 ohms. It is believed that both types, the A15512A and the A15526, have met the objective specifications of the contract. (Author)

AD-620 920 Div. 8/2 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J
HIGH SPEED POWER AMPLIFIER USING AN ELECTRON SWITCHED P-N JUNCTION.
Quarterly interim development rept. no. 1, 27 May-27 Aug 65,
by Nelson E. Ake. 27 Aug 65, 22p. Contract NObsr93306

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Solid state physics, Power amplifiers), (*Power amplifiers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Power amplifiers), Diffusion bonding, Boron, Vacuum apparatus, Electric connectors, Bromides, Oxides, Silicon

A 'paint on' diffusion run was made and diodes were etched from this material for evaluation. The starting material was 'N' and the boron penetration was measured using the 'angle lap stain' technique. The penetration was 1.8 mils. The breakdown voltage measures approximately 800 V and the leakage, (I sub r), is in the order of 10 microamp at 600 V. A vacuum system has been modified to include jigging for electrical connection to wafers under vacuum. A heatable platform with a therometer and variable power supply is also included so that a diode or wafer can be monitored using a curve tracer under controllable conditions of pressures and temperature. Some bare junction diodes have been monitored under various temperatures and pressures (in the order of .01 micron) using this equipment. Diffusion furnaces and the necessary accessories have been readied for: (1) Simultaneous P and N 'paint on', (2) boron pre-diffusion using BBr3, (3) boron drive and simultaneous oxide growth, and (4) initial oxide growth in steam. (Author)

AD-620 923 Div. 8/2 ,26/3
CFSTI Prices: HC $1.00 MF $0.50
INTERNATIONAL RESISTANCE CO PHILADELPHIA PA
PRODUCTION ENGINEERING MEASURES FOR HIGH RELIABILITY, FIXED, FILM, PRECISION RESISTORS.
Quarterly progress rept. no. 10, 1 Apr-30 Jun 65,
by Richard C. Wagner. 30 Jun 65, 21p. Contract DA36 039AMC01461E

Unclassified report

Descriptors: (*Fixed resistors, Manufacturing methods), Reliability (Electronics), Films, Production

Preproduction data for style RNR60 resistor was submitted. The Automatic Binner, Automatic Spiraller and Lead Beader were manicured and placed into operation. Delivery of the Sequential Sealer and Automatic Capper are on schedule. Those areas of the manufacturing process contributing to excessive cost are studied and evaluated, and alternative techniques aimed at reducing cost and increasing output are examined. A facility is established for the manufacture of not less than 6,000 combined units (resistors) of Mil-R-55182 styles RNR55C, RNR60C and RNR65C and 1500 units of style RNR57C per eight hour day single shift.

AD-620 928 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
DESIGN DATA FOR STRIP TRANSMISSION LINE, TANDEM QUARTER-WAVELENGTH DIRECTIONAL COUPLERS.
Data rept.,
by Charles B. May. Sep 65, 18p. Rept. no. NOTS-TP-3848
Task TA RM3781 001 216 1WW115 00 001
NAVWEPS, 8766

Unclassified report

Descriptors: (*Transmission lines, Waveguide couplers), (*Waveguide couplers, Transmission lines), Design, Nomographics

Design equations are given for strip-line, tandem couplers and graphical data are developed to enable the designer to select physical coupler dimensions for specific applications. (Author)

AD-620 946 Div. 8/2 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PHASE MODULATORS OF LIGHT WAVES,
by A. Khanberdiev. 24 Aug 65, 8p. Rept. no. FTD-TT-64-1244
TT, 65-63900

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Turkmenskoi SSR. Ashkhabad. Izvestiya. Seriya FizikoTekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk n4 p117-9 1963.

Descriptors: (*Phase modulation, Light), (*Light, Phase modulation), Interferometers, Optical equipment, Piezoelectric crystals, USSR

It is shown that electromechanical phase modulators will find wide use in spectroscopy and in interferometry of stars, and the electrooptical phase modulators in the technology of communication on optical frequencies.

AD-620 966 See Fld. 17/7

AD-620 981 Div. 8/2
LINCOLN LAB MASS INST OF TECH LEXINGTON
GREATER DOUBLER EFFICIENCY USING VARACTOR DIODES WITH SMALL VALUES OF GAMMA,
by A. I. Grayzel. 3 Feb 65, 1p.

Unclassified report

Pub. in Proceedings of the IEEE v53 n5 p505-6 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Varactor diodes, Effectiveness), Capacitance, Voltage

AD-620 984 See Fld. 19/1

AD-621 031 Div. 8/2 ,8/3
CFSTI Prices: HC $3.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
STATIC AND DYNAMIC PERFORMANCE OF MICROPOWER TRANSISTOR LOGIC CIRCUITS. PART I: MICROPOWER TRANSISTOR CHARACTERIZATION.
Technical rept.,
by L. F. Wagner, R. A. Gilson, O. Pitzalis, and J. D. Meindl. Apr 65, 52p. Rept. no. ECOM-2596
Proj. DA 1P622001A056 02 12

Unclassified report

Descriptors: (*Transistors, Power supplies), (*Circuits, Transistors), (*Microminiaturization (Electronics), Transistors), (*Power supplies, Transistors), Mathematical models, Electrical engineering, Integrated circuits, Switching circuits, Electromagnetic properties, Electrostatics, Dynamics

Report I of this series characterizes micropower transistors for operation between 1 and 1000 microamperes of collector current. Significant effects of operation at these low currents are the increased junction leakage currents at maximum operating temperatures and the decreased current gain at minimum operating temperatures. For many transistors storage times are negligible at microampere currents; therefore, the switching speed of a micropower transistor is limited by device and circuit capacitance. These effects are described by a large signal dynamic micropower transistor model which has been adapted from the Ebers-Moll transistor representation. Switching time equations are derived from simplified forms of this model. Reports II and III apply this work to micropower logic circuit design and application. (Author)

AD-621 033 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
COLLINS RADIO CO DALLAS TEX
RESEARCH AND DEVELOPMENT INVESTIGATION OF A PRECISION DIGITAL FREQUENCY SYNTHESIZER FOR SSB.
Quarterly interim development rept. no. 3, 1 Jan-30 Apr 65,
by T. C. Thomas. 12 Aug 65, 38p. Rept. no. IDR-D577-3
Contract DA28 043AMC00176E Proj. DA 1P6 22001 A058 02

Unclassified report

Descriptors: (*Frequency, Synthesis), Circuits, Digital systems, Miniature electronic equipment, Phase detectors, Oscillators, Radiofrequency oscillators, Medium frequency, Very high frequency, Control systems, Films, Sidebands, Single sideband communication systems, Frequency divider, High frequency

The digital circuits that have been built and tested have shown satisfactory performance over the required environmental conditions and have operated near or below the power dissipation estimates made earlier in the design. The digital circuits are capable of being packaged in miniature high density packages. Considering present developed techniques, the thin-film approach is the most promising to achieve the performance at the power dissipations of the developed digital circuits. The phase comparator/low-pass filter is the major progblem

toward achieving a spurious level goal of 90 db. A 70-db spurious level is more realistic. The configuration of this area requires considerably more work for a conclusion. The multioscillator approach (15 to cover the 2- to 33-mc band) is becoming more feasible. The output combining circuits have presented no problems. The power dissipation is in the order of earlier goals. The problem with this approach is the future miniature packaging. The configuration is foreseen as a hybrid thin-film circuit. Sufficient progress has not been made in the output circuits to draw conclusions. (Author)

AD-621 039 **See Fld. 9/2**

AD-621 043 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
SMALL-SIGNAL TRANSISTOR CHARACTERIZATION FOR THE HF AND VHF RANGE.
Technical rept.,
by Richard L. Brayden, and James D. Meindl.
Jun 65, 36p. Rept. no. ECOM-2612
Proj. DA1P6 22001A056 Task DA1P6 22001A056 01 14
Unclassified report

Descriptors: (*Transistors, Performance (Engineering)), High frequency, Very high frequency, Admittance, Electrical impedance, Germanium, Silicon, Phase (Electronics), Graphics

A technique for the high-frequency characterization of small-signal transistors in the range of 3 to 300 Mc is proposed. The approach presented substitutes relatively accurate low frequency measurements for the normally hard to measure high frequency four-pole parameters. These low frequency measurements in conjunction with a derived set of 'y' parameter expressions can be used to accurately characterize the frequency variation of a transistor's four-pole parameters over the specified frequency range. An equally accurate characterization based on an equivalent circuit is relatively complex. The theoretical fourpole parameters obtained for both a germanium mesa and a silicon planar transistor are compared to the measured four-pole parameters obtained from an extremely accurate measuring set. The results show that an inaccuracy of five percent can be expected in most cases between the predicted and measured four-pole parameters. (Author)

AD-621 065 **See Fld. 13/8**

AD-621 069 **See Fld. 20/8**

AD-621 075 **See Fld. 20/12**

AD-621 084 Div. 8/2
CFSTI Prices: HC $4.00 MF $0.75
FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF
UHF SMALL SIGNAL TRANSISTOR.
Quarterly rept. no. 4, 1 Feb-15 May 65,
by Helmut Wolf, and M. Purnaiya. 15 May 65, 106p. Contract DA28 043AMC00040E Proj. 1P6 22001A05601
Unclassified report

Descriptors: (*Transistors, Ultrahigh frequency), (*Transistor amplifiers, L/Band), Gain, Stability, Noise (Radio), Reliability (Electronics), Environmental tests, Silicon, Design

The report covers principally the design, fabrication, and electrical evaluation of the final quantity of transistors made under this contract. The final shipment of transistors consists of 30 transistors in the stripline package and 70 transistors in a modified TO-18 package. A detailed analysis of all experimental data is given. All transistors meet or exceed the primary requirements on power gain, stability, and noise figure. This includes a gain figure greater than or equal to 37 db; unilaeral gain greater than or equal 12 db; stability factor between 0.7 - 1.5; and noise figure less than 6 db at 500 Mc at the operating level of 12 mW. Reliability data on units mounted in the stripline package is furnished; a further report will cover environmental tests on the modified TO-18 package. (Author)

AD-621 098 Div. 8/2 ,8/3 ,30/3
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
TEMPERATURE COMPENSATION OF TRANSISTOR INTEGRATOR,
by C. P. Wang. 16 Jun 64, 2p.
Unclassified report

Pub. in The Review of Scientific Instruments v35 n11 p1493-4 Nov 64 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Temperature sensitive elements, Transistors), (*Integrators, Temperature control), (*Transistors, Temperature sensitive elements), Amplifiers, Networks, Synchros

It is shown that the temperature dependence of an inverted transistor can be very effectively used for temperature compensation. Conditions were derived for complete compensation of an integrator amplifier with emitter follower output and single-stage amplifier. Both compensations were used in the integrator unit incorporated in a delay time electronic servo, giving a temperature stability of better than 0.01 V/C at the integrator output, or better than 5 nsec/C at the servo output. Smaller drift can be achieved, if desired, with more careful choice of transistor types and transistors for compensation. (Author)

AD-621 103 **See Fld. 20/14**

AD-621 132 Div. 8/2 ,17/2
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF METALLURGICAL ENGINEERING
MORPHOLOGICAL CHANGES OF A SURFACE OF REVOLUTION DUE TO CAPILLARITY-INDUCED SURFACE DIFFUSION,
by F. A. Nichols, and W. W. Mullins. 2 Oct 64, 10p. Contract DA31 124ARO D190 AROD , 4838:1
Unclassified report

Pub. in Journal of Applied Physics v36 n6 p1826-35 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cathodes, Field emission), (*Corrosion inhibition, Cathodes), (*Surface properties, Cathodes), Diffusion, Bodies of revolution, Partial differential equations, Sintering, Surface tension

The partial differential equation describing morphological changes of a surface of revolution due to capillarity-induced surface diffusion has been derived under the assumption of isotropy of surface tension and surface self-diffusion coefficient. A stable, convergent finitedifference method has been developed for the general case of an arbitrary surface of revolution and solutions have been obtained for the specific problems of the blunting of field-emission tips and the sintering of spheres. Spheroidization of cylindrical rods, as well as field-emission tips with taper below a certain critical value, is predicted; for tapers above the critical value, steady-state shapes are predicted and equations describing the blunting and recession of the tips are presented. If the sintering results for spheres are represented by a plot of log x/a vs log t, it is found that the inverse slope varies from approximately 5.5 to approximately 6.5 for the range 0.05 or = x/a or = 0.3, in contrast with the constant value of 7 found by Kuczynski from an order-of-magnitude analysis. At higher values of x/a, n increases steadily and without bound. (Author)

AD-621 136 Div. 8/2 ,14/6
CFSTI Prices: HC $4.00 MF $1.00
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
ADVANCED FERRIMAGNETIC MATERIALS APPLIED TO DIGITAL PHASE SHIFTERS.
Semiannual rept. no. 2, 25 Dec 64-25 Jun 65. Aug 65, 127p. Rept. no. SJ. M-220-0052-6
Contract AF30 602 3490 Proj. arpa order no. 550
Unclassified report

See also AD-610 632.

Descriptors: (*Phase shifters, Ferromagnetic materials), (*Ferromagnetic materials, Phase shifters), Digital systems, Microwave equipment, Magnetic properties, Garnet, Iron compounds, Yttrium compounds, Gadolinium compounds, Aluminum compounds, Ferrites, Nickel compounds, Zinc compounds, Magnesium compounds, Manganese compounds, Lithium compounds, Waveguides, S band, X band, Dielectric properties

A resume is presented outlining the present status of ferrite digital phase shifters including the interpretation of the influence of material characteristics on the operating dynamics of phase shifters. The importance and influence of the following material parameters are discussed: saturation magnetization, remanent magnetization, linewidth, remanence ratio, squareness, coercive field, density, grain size, dielectric constant, dielectric loss tangent, anisotropy field, peak power threshold, switching coefficient, and magnetostriction. The experimental investigations have concentrated on the study of the control and variation of the above parameters and the evaluation of materials with known properties in rf structures. Magnetic losses are discussed from an analytical and experimental standpoint. Investigations on magnetic losses have been conducted at S-band, and a preliminary interpretation of the data is presented. Structural and material parameter studies have been carried out in an X-band waveguide phase shifter structure. The results of these studies are presented together with some comparison, where possible, with recent theoretical publications. (Author)

AD-621 141 **See Fld. 20/12**

AD-621 147 Div. 8/2
CFSTI Prices: HC $4.00 MF $0.75
ELECTRONICS RESEARCH LAB MONTANA STATE COLL BOZEMAN
INVESTIGATION OF CONSTANT DELAY NARROW BAND IF AMPLIFIERS.
Final rept. for Jun 63-May 65,
by Paul Winninghoff, and C. P. Edwards. May 65, 116p. Rept. no. ERL-8-0009-613
Contract DA36 039AMC03375E Proj. DA5A679191D908,2Z44 02 001 Task 5A6 79191D908 02 ,5A6 79191D908 02 03
Unclassified report

Descriptors: (*Intermediate frequency amplifiers, Narrowband), Medium frequency, Band-pass filters, Delay circuits, Coils, Performance (Engineering)

The program covers the design, construction and testing of two bread-board narrowband IF amplifiers centered at 455 kc having a constant time delay characteristic over the 3 db passband. The first amplifier uses a passive filter and equalizer ahead of the amplifier section. The amplifier uses dual conversion to lower the IF frequency, and thus decreases the sensitivity of the time delay characteristic to changes in component value. Though the individual sections of this amplifier were tuned to a fair degree of precision, the overall response was unstable. Several limitations of this design, discussed in the text, were overcome by taking the second approach. The second approach uses a staggered tuned amplifier employing cascaded sections having a third order equal ripple time

delay response. A computer program was generated to compute all necessary filter parameters. This approach lowered the required Q sufficiently so that air core coils could be used instead of ferrite core coils. Also included are various methods of measuring time delay for narrowband amplifiers. A study is made of the sensitivity to critical components for several designs including the familiar maximally flat time delay response. A study is also made of the time delay distortion caused by the lowpass to bandpass transform. (Author)

AD-621 149 Div. 8/2 ,8/3
CFSTI Prices: HC $3.00 MF $0.75
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
A DIVIDED-BAND AMPLIFIER SYSTEM USING CONSTANT-RESISTANCE NETWORKS.
Technical rept.,
by C. Seligson. Sep 65, 94p. Rept. no. EERL-43 ,TR-88
Contract DA36 039AMC00034E Proj. 1G6 22001A055 02

Unclassified report

Descriptors: (*Frequency dividers, Amplifiers), (*Amplifiers, Frequency dividers), (*Networks, Synthesis), Band-pass filters, Low-pass filters, Frequency, Correlators. Gain, Impedance matching, Resistance (Electrical), Electrical engineering, Programming (Computers)

The purpose of this study is the utilization of high-pass and low-pass constant-resistance networks in a dividedband amplifier system. A design procedure is developed to provide a flat frequency response for a system with 2 to the n power amplifiers, n = 1,2,.... The networks used as the amplifiers in this system are designed with equal input and output resistances and the proper gains. A computer program was modified to handle the complexity of the calculations involved in determining the results to be expected from the eight-amplifier divided-band structure. These results indicate that the system, with its crossover frequencies equally spaced on a linear scale, is not suited to application as a shaping filter. They also demonstrate, however, that the system, with its crossover frequencies equally spaced on a logarithmic scale, possesses a frequency response that can be easily shaped. The use of this structure as a time-varying system also shows promise. A simple relation exists between the value of the frequency response at any one frequency and the gains of the amplifiers. The response of the divided-band structure is strongly influenced by a change in the multiplying factor separating the crossover frequencies of the highpass and low-pass networks. The design procedure, however, includes the means of obtaining a flat response for any interval between cutoff points. (Author)

AD-621 174 Div. 8/4
CFSTI Prices: HC $2.00 MF $0.50
HARRY DIAMOND LABS WASHINGTON D C
ELECTRICAL LEAKAGE IN THE SN1551B,
by Harold Edwin Boesch,Jr.. 15 Jul 65, 34p.
Rept. no. TM-65-34
Proj. DA1P523801A300 ,HDL96300

Unclassified report

Descriptors: (*Electron tubes, Electric discharges), (*Oscillators, Noise (Radio)), Electrodes, Ionization gages, Films, Calibration

Measurements were made on SN1551B oscillator tubes to determine the cause of electrical leakage in production tubes, to determine the effect of leakage on noise threshold voltage and noise generation during tube operation, and to determine whether the tube can be calibrated for use as its own ion gauge to measure its internal pressure. Tests showed, as postulated, that leakage was caused by deposition of a conducting film on the surfaces of insulators when the getter was flashed. Experimental evidence implicates electrical leakage as a factor in reductions in the noise threshold voltage and noise generated during oscillator operation. Although the experimental equipment was inadequate to complete measurements, the calibration of the tube as its own ion gauge appears possible and practicable. Further experimental work is recommended, to determine means of adequately confining getter flash during tube production and to complete calibration of the tube as its own ion gauge. (Author)

AD-621 204 **See Fld. 20/6**

AD-621 206 Div. 8/2 ,25/6 ,20/3
LINCOLN LAB MASS INST OF TECH LEXINGTON
EFFECTS OF ELECTRON IRRADIATION ON METALOXIDE SEMICONDUCTOR TRANSISTORS,
by Alan G. Stanley. 25 Feb 65, 3p. Rept. no. JA-2532
Contract AF19 628 5167
ESD , TDR-65-434

Unclassified report

Pub. in Proceedings of the IEEE, v53 n6 p627-8 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Semiconductor devices, Radiation damage), (*Transistors, Radiation damage), (*Radiation damage, Transistors), Oxides, Electron bombardment, Space environmental conditions, Electrical properties, Ionization

P-channel metal-oxide semiconductor field effect transistors are shown to be very susceptible to ionizing radiation. The turn-on voltage increases with total electron dose until the devices can no longer be turned on. The source to drain leakage current also increases. A Mechanism is suggested to explain the observed phenomena. (Author)

AD-621 250 Div. 8/2 ,8/3 ,7/5
CFSTI Prices: HC $4.00 MF $0.75
STANFORD RESEARCH INST MENLO PARK CALIF
ENERGY CONVERSION TECHNIQUES FOR MICROWAVE GENERATION.
Final technical rept. for 30 Mar 64-15 May 65,
by M. C. Pease. Aug 65, 105p. Rept. no. 4913
Contract AF30 602 3368 Proj. 4506 Task 450603
RADC , TR-65-254

Unclassified report

Descriptors: (*Radiofrequency generators, Energy conversion), (*Energy conversion, Microwave oscillators), (*Microwave oscillators, Energy conversion), (*Pulse generators, Microwaves), Electric discharges, Sparks, Microwave equipment, Radiofrequency pulses, Circuits, Electrical engineering

Converters were studied, using spark gaps operating in various types of microwave structures. The general design principles that have emerged from this study are discussed in considerable detail. It is recognized that the use of spark gaps for RF generation is generically related to the devices used by early workers, and to certain devices currently being studied for sub-microwave operation. A survey of some of the more notable steps in the historical development of such devices is included. The work, in general, demonstrates that spark gaps can be used for the generation of short (e.g., 100 periods) pulses of microwave energy. It also demonstrates that this method of generating power does require very careful attention to the integrated design of the spark gap and its associated microwave and driving circuitry. The interactions between the spark gap and both the microwave circuitry and the driving circuitry are, in some cases, quite subtle. At this stage in the understanding of the process, it is not sufficient to study the different components separately. It is, instead, of paramount importance to study in detail the performance of the system as a functioning whole. It is concluded that the use of spark gaps for the generation of short pulses at microwave frequencies is well worth further exploration. (Author)

AD-621 260 **See Fld. 9/3**

AD-621 324 **See Fld. 9/3**

AD-621 337 **See Fld. 9/3**

AD-621 355 Div. 8/2 ,26/3
CFSTI Prices: HC $1.00 MF $0.50
CTS CORP ELKHART IND RESEARCH AND DEVELOPMENT DIV
PRODUCTION ENGINEERING MEASURE FOR SUBMINIATURE, TRANSISTOR TYPE POTENTIOMETERS.
Quarterly progress rept. no. 15, 1 Jan-31 Mar 65, by C. L. Holmes, and D. C. Kinsey. 31 Mar 65, 22p. Contract DA36 039SC85976

Unclassified report

See also AD-608 934.

Descriptors: (*Potentiometers, Manufacturing methods), (*Subminiature electronic equipment, Potentiometers), Transistors, Reliability (Electronics), Performance (Engineering), Life expectancy, Tests

1800 samples were fabricated and tested to SCS-112 Technical Requirement which did not satisfactorily perform all the requirements. 1600 controls were refabricated and retested in an attempt to meet those test requirements which were not met on the first 1800 group. After completion of the second test group, test specifications of Technical Requirement SCS-112 had been met satisfactorily on all tests except moisture resistance on the 50 Omega controls of both styles and rotational life testing on the 25000 Omega bushing mount style. Because these two specification requirements are beyond the present state of the art, Technical Action Request No. 8 was submitted to request a change in test requirements. The 2400 controls on the 10,000 hour load life high reliability study have completed the testing phase with very satisfactory results. A summary of this test data is included. (Author)

AD-621 357 Div. 8/2
CFSTI Prices: HC $2.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
THE EFFECT OF LOAD CAPACITORS ON THE FREQUENCY OF QUARTZ CRYSTALS.
Technical rept.,
by Arthur D. Ballato. Jun 65, 39p. Rept. no. ECOM-2617
Proj. DA 1P6 22001A058 Task 1P6 22001A058 01

Unclassified report

Descriptors: (*Piezoelectric crystals, Quartz), (*Vibrators (Electrical), Quartz), (*Capacitors, Quartz resonators), (*Quartz, Piezoelectric crystals), Resonance, Frequency shift, Electrical impedance, Mathematical analysis, Measurement, Crystal filters

The equivalent circuit of a piezoelectric vibrator has associated with it a number of critical frequencies in the vicinity of the resonance region. Addition of a capacitor in series or in parallel with the resonator element results in a shifting of these frequencies. The standard practice for measuring the frequency of antiresonance quartz crystal units is to place the load capacitor in series with the crystal unit. The resonance frequency measured with the series capacitor is assumed to be equivalent to the antiresonance frequency obtained with the same capacitor placed in parallel with the crystal unit. The analysis given shows this to be the case only in the limit of lossless crystals, whereas a frequency difference of several parts per million may be encountered with practical units. A simple, approximate formula is derived for the frequency error, and examples are given. (Author)

AD-621 362 Div. 8/2 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
PHILCO BLUE BELL PA APPLIED RESEARCH LAB

METAL BASE TRANSISTOR II.
Quarterly progress rept. no. 3, 1 Jan-31 Mar 65,
by Walter Kane. 30 Apr 65, 35p. Contract
DA28 043AMC00161E Proj. DA1P6
22001A056 Task 1P6 22001A056 02
Unclassified report

Descriptors: (*Transistors, Semiconducting films), (*Semiconducting films, Transistors), Resistance (Electrical), Electrical properties, Diodes (Semiconductor), Copper, Silver, Aluminum, Thickness, Metal films, Electric discharges, Zinc compounds, Cadmium compounds, Sulfides, Gold, Gain

By fitting resistance versus thickness data for evaporated copper, silver, and aluminum films to the Fuchs-Sondheimer equation, the conductivity mean-free-path was determined for these metals and found to be independent of deposition rate. The minimum thickness necessary for a continuous film of silver was found to decrease with increasing deposition rate. A triode was made with a common emitter current gain of 10. A large increase in Beta with time was measured in this device, with no corresponding change in base resistance. Shorting problems have seriously hindered both triode and diode work. Considerable effort has been directed at this problem, and some progress is reported. (Author)

AD-621 371 Div. 8/2 ,8/1
CFSTI Prices: HC $3.00 MF $0.75
WESTINGHOUSE DEFENSE AND SPACE CENTER BALTIMORE MD SURFACE DIV
STUDY OF MICROCIRCUITRY TECHNIQUES UTILIZING MOLECULAR ENGINEERING.
Final rept.
1965, 90p. Rept. no. MDE-5513
Contract NObsr81380 Proj. SR0080302
Unclassified report

See also AD-429 385, AD-437 949.

Descriptors: (*Microminiaturization (Electronics), Molecular electronics), (*Molecular electronics, Microminiaturization (Electronics)), (*Pulse amplifiers, Molecular electronics), Manufacturing methods, Circuits, Display systems, Solid state physics

The major accomplishments of the contract program were: (1) An extensive study of molecular techniques for the fabrication of X and Y-amplifiers for peripheral driver circuitry of solid state display systems. (2) The development of a planar all-diffused process used in the final amplifier fabrication which accomplished all of the requirements of satisfactory process control, yield, suitability for mass production and economy, as well as the obvious requirements of meeting electrical specifications. (3) The design and development of a unique switch-field effect resistor circuit which simplified thermal considerations, allowed higher density packaging, and reduced power supply requirements. (4) Development of a high density packaging scheme allowing 16 amplifiers to be packaged in one linear inch modules which could be stacked end to end in an actual display system environment. The final phase of the program was concerned with an investigation of possible additional applications of the pulse amplifier, or a modification of the amplifier, to NIXIE driver requirements. It was concluded that the pulse amplifier is capable of driving miniature NIXIE tubes having current requirements on the order of one milliampere. Furthermore, a slightly modified pulse amplifier was developed which is capable of driving the complete line of NIXIE tubes and alpha-numerics and is compatible with monolithic microcircuit fabrication techniques.

AD-621 375 See Fld. 4/2

AD-621 376 See Fld. 4/2

AD-621 449 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
COLLEGE OF AERONAUTICS CRANFIELD (ENGLAND) DEPT OF ELECTRICAL AND CONTROL ENGINEERING
A TIME DOMAIN METHOD OF MEASURING TRANSISTOR PARAMETERS FOR COMPLETE SMALL SIGNAL CHARACTERIZATION UP TO 1 GC.
Master's thesis,
by Frank Richard Davis. Jul 65, 96p. Rept. no. EE-65-1
Unclassified report

Descriptors: (*Transistors, Test methods), Frequency, Measurement, Time, Transmission lines, Probes (Electromagnetic), Programming (Computers), Frequency analyzers

This report describes a method of measuring transistor small signal parameters over a wide frequency range using time domain techniques. A sampling oscilloscope and tunnel diode pulse generator are used to obtain five times response curves from the transistor which is inserted into a 50 ohm coaxial air-dielectric transmission line. A digital computer is used to perform frequency spectrum analysis on the curves, and to calculate the open and short circuit parameters for complete characterization of the transistor. The hybrid parameters of an RC network and three transistors were measured and compared with measurements made in the frequency domain. Good agreement was obtained between methods up to 500 Mc with reduced accuracy to 1 Gc. (Author)

AD-621 510 Div. 8/2
CFSTI Prices: HC $1.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
CONCEPTUAL DESCRIPTION OF A FAMILY OF FREQUENCY SYNTHESIZERS.
Technical note,
by B. E. White. 8 Sep 65, 23p. Rept. no. TN-1965-43
Contract AF19 628 5167
ESD , TDR-65-421
Unclassified report

Descriptors: (*Frequency, Synthesis), Frequency converters, Frequency multipliers, Waveform generators, Switching circuits, Frequency dividers

A family of frequency synthesizers is described. Each member of the family generates one of many equally-spaced frequencies by utilizing identical modules, the number of which is related to the number of possible frequencies. For any design in the family which uses frequency division in the modules, there exists a dual design which utilizes frequency multiplication. Block diagrams and formulas are included which may be useful in designing frequency synthesizers for communication system applications. (Author)

AD-621 517 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.75
RAYTHEON CO BURLINGTON MASS MICROWAVE AND POWER TUBE DIV
SOLID STATE MICROWAVE POWER RECTIFIERS.
Final rept.,
by R. H. George. Aug 65, 88p. Contract AF30 602 3481 Proj. DA 6414
RADC , TR-65-224
Unclassified report

Subcontracted to Purdue Univ., Lafayette, Ind. School of Electrical Engineering, rept. no. TR-EE65-5.

Descriptors: (*Rectifiers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Rectifiers), Microwave equipment, Direct current, Performance (Engineering), S band, Radiofrequency power, Effectiveness

Special test equipment were developed for rapidly recording the static characteristics of the test diodes both before and after testing, for the purpose of correlating their static characteristics with their performance as microwave power rectifiers. This equipment was very useful in selecting diode for test. Special equipment for determining rectification efficiency were developed and tests made at 2.44, 5.72, and 10.17 Gc/s. At the beginning of this investigation point contact diodes were the only type that had shown microwave power rectification efficiencies in excess of 60%. However, after the Raytheon Company had demonstrated the feasibility of flying a helicopter powered from a microwave beam, Hewlett-Packard Associates submitted four samples of their new Schottky barrier diodes in a 0.180 in x 0.080 in package, and Sylvania Products Semiconductor Division submitted 12 samples of an experimental Schottky barrier diode in cartridge form for power rectification efficiency tests. Somewhat later the Transitron Electronic Corporation submitted samples of their SG-8004 and SG-8005 diodes, and the Japanese submitted samples of their new 1N82BG diodes for test.

AD-621 520 See Fld. 9/2

AD-621 532 Div. 8/2
CFSTI Prices: HC $3.00 MF $0.50
TEXAS INSTRUMENTS INC DALLAS
LOW-NOISE L-BAND TRANSISTOR.
Final rept. for 15 May 64-30 Jun 65,
by Doyle S. Granberry, Richard L. Petritz, and Roger R.Webster. 30 Jun 65, 51p. Rept. no. TI-03-65-61
Contract DA28 043AMC00119E Proj. 1P6 22001A056 Task 1P6 22001A056 04
Unclassified report

Descriptors: (*Transistors, L band), Noise (Radio), Germanium, Transistor amplifiers, Microwave amplifiers, Gain, Performance (Engineering)

A research and development program is described for a germanium microwave low-noise amplifier transistor with a noise figure goal of 3.0 db and practical gain at 1.3 Gc. Final state-of-the-art samples averaged 3.1 db noise figure and 9.4 db gain. Technology work is described and the device design is discussed. Microwave testing is discussed and test results are given. (Author)

AD-621 549 Div. 8/4 ,26/3 ,20/3
CFSTI Prices: HC $3.00 MF $0.75
TUNG-SOL ELECTRIC INC BLOOMFIELD N J ELECTRON TUBE DIV
ELECTRON TUBES RADIATION RESISTANT PILOT LINE PRODUCTION.
Quarterly progress rept. no. 7, 1 Dec 64-28 Feb 65,
by William A. Buchanan. 28 Feb 65, 85p. Contract DA36 039AMC01476E
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-612 658.

Descriptors: (*Shielding, Electron tubes), (*Electron tubes, Manufacturing methods), Nuclear particles, Radiation damage, Aluminum compounds, Silicates, Glass, Seals (Stoppers), High-temperature research, Industrial equipment, Welding, Reliability (Electronics), Thermal stresses, Thermionic emission, Cathodes (Electron tubes), Moisturingproofing

During this quarter all work required by the contract for delivery of Engineering Samples, items 1-1-1B and 1-1-1C, was completed with the exception of the high temperature (500C) life testing of tube types 6360, 6205, and 5886 in Alumino-Silicate glass. Pulse radiation tests were conducted. The results of this test plus those from the steady state reactor test at Brookhaven are given in Appendix II. Sealing of tube type 6205 using RF or heliarc welding techniques was not successful in improving cathode emission. Although good vacuum tight seals were obtained low emission remains a serious problem. Parts for 6080WB tubes are

being fabricated to meet the pre-production quantity and delivery date. The ceramic spacers for tube type 6360 have been received and tubes assembled. High temperature bakeout (650C) on exhaust still affects cathode emission. Modifications to the exhaust equipment, considered at the end of the sixth quarter, were made during December. (Author)

AD-621 557 **See Fld. 11/9**

9/2. COMPUTERS

AD-620 828 **See Fld. 18/9**

AD-620 858 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COMPUTERS IN AUTOMATIC SYSTEMS,
by A. A. Feldbaum. 12 Aug 65, 20p. Rept. no. FTD-TT-65-618
TT , 65-63878

Unclassified report

Unedited rough draft trans. of mono. Vychislitel'nye Ustroystva v Avtomaticheskikh Sistemakh (USSR) 1959 p367-76.

Descriptors: (*Digital computers, Integrators (Computers)), (*Analog computers, Integrators (Computers)), (*Integrators (Computers), Computer logic), Servomechanisms, Computers, Control sequences, Input-output devices, USSR

A digital differential analyzer working in double numeration is discussed.

AD-620 861 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SEMIPERMANENT MEMORAGE-STORAGE DEVICE OF THE TRANSFORMER TYPE,
by N. M. Tishchenko, and Yu. A. Avak. 13 Aug 65, 5p. Rept. no. FTD-TT-65-639
TT , 65-63871

Unclassified report

Unedited rough draft trans. of Russian patent 165 586, pub. 12 Sep 62, appl. 796756/26-24.

Descriptors: (*Magnetic core storage, Semiconductor devices), (*Transformers, Magnetic core storage), Computer logic, Data storage systems, Patents, USSR

A semiconductor memory (storage) device is described, of the transformer type which contains a matrix of mutually perpendicular input and output bus-bars connected by magnetic circuits which has the distinguishing feature that for the purpose of simplifying and reducing the cost of making the device, and also for the convenience in changing the information, the indicated magnetic circuits are made up in the form of easily removable closed clamps made of soft magnetic material. (Author)

AD-620 872 **See Fld. 9/5**

AD-620 911 Div. 30/2 ,31/9
CFSTI Prices: HC $7.00 MF $1.75
CONTROL DATA CORP MINNEAPOLIS MINN
DESIGN STUDIES FOR A HYBRID COMPUTER SYSTEM.
Final development rept. for 1 Sep 64-1 Jul 65. 31 Jul 65, 359p. Rept. no. G03242
Contract NObsr93003 Proj. SF007 02 01 Task 7140

Unclassified report

Descriptors: (*Analog-digital computers, Shipborne), (*Naval operations, Analog-digital computers), Automation, Control systems, Data processing systems, Integrators (Computers), Computer logic, Circuits, Transistors, Microminiaturization (Electronics)

The results are presented of a study conducted for the purpose of determining design requirements and operational philosophies for a hybrid data processing system in a real-time shipboard automation and control system utilizing an optimum combination of digital and analog techniques. The following investigations were included: automation tasks, hybrid simulation techniques, approaches to integrating digital and analog processing, microelectronic circuits and packaging available at present and in the future, and functional separability of the digital portion of the system for general purpose data processing. The recommended system would monitor and control ship's power plant and would organize, summarize, and display operational information to the commander. Pertinent design criteria of the hybrid system are described, with particular attention to the hardware and software provisions for priority multilevel interrupts and task execution priority selection, to the remote display and data entry units, and to the computer logic circuitry and standard NAFI packaging. Microelectronics (integrated circuits) should be employed using NOT-AND/OR circuits of the Transistor-Transistor Logic type. (Author)

AD-620 915 Div. 30/2 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
MARQUARDT CORP VAN NUYS CALIF
ASSOCIATIVE TAG MEMORY.
Final technical rept. for Jul 64-Apr 65,
by Ralph W. Haas, and Earl H. Blevis. Jul 65, 92p. Rept. no. 637/885/4266
Contract AF30 602 3471 Proj. 5581 Task 558108
RADC , TR-65-178

Unclassified report

Descriptors: (*Computer storage devices, Feasibility studies), (*Photoelectric materials, Computer storage devices), (*Ferroelectric materials, Computer storage devices), Digital computers, Data storage systems, Computer logic, Ferroelectric crystals, Single crystals, Thin films (Storage devices), Electron optics, Switching circuits, Photons

A research and development program was conducted to demonstrate the principle feasibility of utilizing ferroelectric and photoconductor elements to implement an associative tag memory. An anlytical study was performed to provide an insight to the various design tradeoffs of implementation. A material effort was directed toward producing both thin film and single crystal materials. A small breadboard model was constructed which demonstrated the ability of a string of photoconductor and ferroelectric elements to provide signal indication for various match conditions. A logic utilizing this implementation was developed for a number of inquiry commands. (Author)

AD-620 941 **See Fld. 17/2**

AD-620 964 **See Fld. 1/4**

AD-621 021 **See Fld. 18/9**

AD-621 023 **See Fld. 20/8**

AD-621 025 **See Fld. 12/1**

AD-621 039 Div. 30/2 ,8/2 ,8/3
CFSTI Prices: HC $6.00 MF $1.25
STANFORD RESEARCH INST MENLO PARK CALIF
INVESTIGATION OF PROPAGATION-LIMITED COMPUTER NETWORKS.
Final rept., phase 2, 31 May 64-31 May 65,
by B. Elspas, J. Goldberg, R. A. Short, and H. S. Stone. Jul 65, 217p. Rept. no. SRI-4523
Contract AF19 628 2902 Proj. 4641 Task 464101
AFCRL , 64-376 (II)

Unclassified report

See also AD-603 165.

Descriptors: (*Computer logic, Propagation), (*Digital computers, Computer logic), (*Data transmission systems, Computer logic), (*Networks, Digital computers), Electromagnetic pulses, Time-lag theory, Electrical engineering, Combinatorial analysis, Communication theory

This report summarizes the results of the second year of research on techniques for the analysis, organization, and design of logical networks in which the propagation delays on the lines connecting the operational blocks of the network are appreciable compared to the delays within the blocks. Research on the analysis and design of fully asynchronous propagation-limited logic networks is reported in two sections, as follows: (1) The antiparallel control logic scheme, introduced in the first year's work, is extended to loop and parallel branch networks, and its validity for realizing general logical behavior is demonstrated; and (2) techniques are developed for embedding non-propagation-limited networks that have general, multiple-output combinational and sequential behavior within propagation limited networks. Research on techniques for propagation-limited computer system organization and analysis is reported in three sections, as follows: (1) Principles of organizing a general-purpose computer, that tend to minimize the actual path-length required for an average cycle of computation, are considered; (2) a functional logical design is presented for an asynchronous arithmetic multiplier; and (3) Two graph models for the communications within a propagation-limited system are analyzed.

AD-621 055 Div. 30/2 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MAGNETIC INTEGRATION AND DIFFERENTIATION OF ELECTRIC SIGNALS,
by M. A. Rozenblat, and O. G. Kasatkin. 15 Jun 65, 9p. Rept. no. FTD-TT-65-217
TT , 65-63955

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Doklady, v155 n5 p1066-9 1964.

Descriptors: (*Magnetic core storage, Analog computers), (*Analog computers, Magnetic core storage), Magnetic j s, Ferromagnetic materials, Electric current, Signals, Electromagnetic pulses, Integrators (Computers), Differentiating circuits, USSR

This report discusses the application of branched magnetic cores of ferromagnetic materials, with a rectangular hysteresis, to analog memory devices.

AD-621 066 **See Fld. 5/2**

AD-621 067 **See Fld. 5/2**

AD-621 086 Div. 30/2 ,2/2 ,15/1
CFSTI Prices: HC $5.00 MF $1.00
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
A CRITERION FOR THE QUANTIZATION OF LINEDRAWING DATA.
Technical rept.,
by Jeremy M. Glass. May 65, 165p. Rept. no. TR-400-112
Contract AF AFOSR24 65 Proj. 9769 Task 976902
AFOSR , 65-1495

Unclassified report

Descriptors: (*Data transmission systems, Mechanical drawings), (*Curved profiles, Data transmission systems), Data storage sys-

tems, Graphics, Maps, Digital computers, Optimization, Nonlinear differential equations, Boundary value problems, Probability

The digital transmission of line-drawing data requires that the data first be quantized. Since quantization tends to degrade the original data, it is desirable to employ as fine a quantization as possible. A criterion is developed for enabling one to determine the coarsest possible quantization that will preserve the original data to within a specified tolerance. In the criterion developed, line drawings are thought of as thin elastic beams, which can be characterized by means of their strain-energy density functions. Quantization is seen to result in a spreading of these density functions, creating an uncertainty region in an energy space, the uncertainty decreasing with finer quantization. Of the possible continuous reconstructions that can be generated from the quantized data, there is one that is of particular interest - the minimum-energy curve. An appropriate quantization is determined by requiring that the total energies of the minimum-energy curve and the original curve be within a specified tolerance.

AD-621 142 Div. 30/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE DESIGNING OF EXTRAPOLATING DISCRETE SERVO SYSTEMS,
by L. T. Kuzin. 30 Aug 65, 16p. Rept. no. FTD-MT-65-228
TT , 65-63956
Unclassified report

Edited machine trans. of Inzhenerno-Fizicheskii Institut. Vychislitelnaya Tekhnika; Sbornik Statei (USSR) n2 p39-50 1961.

Descriptors: (*Control systems, Automatic), Integrators (Computers), Polynomials, USSR

An extrapolating servo system is defined as a special type of discrete system whose output reproduces a continuous signal coinciding at discrete moments of time with the input signal and where there is produced continuously a polynomial on the basis of the preceding discrete points (or near them); by means of the polynomial there is made an extrapolation and prediction of the future discrete value of the input signal. Such extrapolation properties are of value in the digital control of computers for reduction of quantity of stored data. The extrapolation system is based on the possibility of generating any polynomial by means of integrators. When ideal integrators are connected in series and appropriate initial biases are fed into the input of each, from the output of the last integrator there may be obtained a voltage varying according to the law of any polynomial. An example is given for a polynomial of third degree.

AD-621 148 Div. 30/2 ,12/2 ,6/6
CFSTI Prices: HC $3.00 MF $0.75
BENDIX RADIO DIV BENDIX CORP BALTIMORE MD
IN-FLIGHT DECISION SYSTEM.
Final rept.
25 Jun 65, 81p. Contract NOw64 0448d
Unclassified report

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Descriptors: (*Target recognition, Analog computers), (*Pattern recognition, Target discrimination), (*Terminal guidance, Analog computers), Bionics, Simulation, Guided missiles

Contents: In-flight decision system, Computer simulation, The analog recognition system, Neutral networks.

AD-621 207 Div. 30/2
LINCOLN LAB MASS INST OF TECH LEXINGTON
A UNIVERSAL MICROPOWER LOGIC ELEMENT,
by William G. Schmidt. 12 Feb 65, 2p. Rept. no. JA-2533
Contract AF19 628 5167
ESD , TDR-65-435
Unclassified report

Pub. in Proceedings of the IEEE v53 n6 p629 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Computer logic, Gates (Circuits)), Switching circuits, Relaxation oscillators

Described is a logic circuit which can operate as an AND, OR, NOR or NAND circuit as well as a flip-flop. In addition, it is capable of exceptionally low-power operation while maintaining excellent switching times. (Author)

AD-621 209 **See Fld. 5/2**

AD-621 223 **See Fld. 12/1**

AD-621 270 Div. 30/2 ,20/6
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
DIGITAL COMPUTER AUTOMATION OF BODY BURDEN RETENTION DETERMINATIONS.
Technical rept.,
by Frank Stanley Dombek. Aug 65, 46p. Rept. no. GNE-65-10
Unclassified report

Descriptors: (*Whole body irradiation, Determination), (*Radioactive decay, Special functions (Mathematical)), Programming (Computers), Half life, Nonlinear systems, Least squares method, Biological assay, Sequences, Automation, Digital computers

The report summarizes the task of developing a method of unscrambling a complex homogenization of individual exponential functions. Essentially the problem reduces to, given a set of experimental data known to consist of a series of different exponential decay functions, find each of these functions. The mathematical technique chosen for the investigation was that of non-linear least-squares. Utilizing the method of least squares, a computer program was written, BRAT (Biological Retention Analysis Technique) in Kingstran for the IBM-1620. The program itself was 'taylored' for the USAF Radiological Health Laboratories, although its application to 'fitting' of other compositions with exponential decay is obvious (e.g. the determination of radioactive decay chains by half-life, Bio-assay, etc.). (Author)

AD-621 277 **See Fld. 6/16**

AD-621 354 **See Fld. 9/4**

AD-621 379 **See Fld. 5/10**

AD-621 408 **See Fld. 5/2**

AD-621 441 **See Fld. 18/8**

AD-621 490 Div. 30/2
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
CAN LOGIC ARRAYS BE KEPT FLEXIBLE.
Physical and mathematical sciences research papers,
by William F. King,IIIan, and Alfred Giusti. Aug 65, 12p. Rept. no. AFCRL-65-547 ,PMSRP-123
Proj. 4641 Task 464104
Unclassified report

Pub. in Electronic Design May 24 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Computer logic, Synthesis), (*Microminiaturization (Electronics), Computer logic), Integrated circuits, Model tests, Gates (Circuits), Flexible structures, Silicon

This report introduces the modifiable logic array concept and describes early investigations concerning a modifiable eight-neighbor array. The problems of analysis and synthesis in such a topological limited space are considered. (Author)

AD-621 516 Div. 30/2
CFSTI Prices: HC $4.00 MF $1.00
GENERAL PRECISION INC GLENDALE CALIF
STUDY OF ASSOCIATIVE PROCESSING TECHNIQUES.
Final rept.,
by Richard H. Fuller, R. M. Bird, and R. M. Worthy. Aug 65, 135p. Contract AF30 602 3371
Proj. 5581 Task 558109
RADC , TR-65-210
Unclassified report

See also AD-608 427.

Descriptors: (*Pattern recognition, Digital computers), (*Digital computers, Pattern recognition), (*Programming (Computers), Pattern recognition), Computer logic, Control sequences, Information retrieval, Numerical methods and procedures, Artificial intelligence, Input-output devices, Word association, Correlation techniques, Data storage systems

This report describes designs of two novel stored program digital machines which process non-numeric data by use of distributed associative logic. The first machine is an associative processor, which is programmed to abstract properties from visual or other patterns, and to classify patterns by use of these properties. Associative logic simultaneously evaluates many linear threshold decision functions at high solution rates and with high digital accuracy. Functional behavior of the machine is easily modified by changing memory contents. The techniques used to evaluate threshold functions may also be used to evaluate arbitrary Boolean functions of stored and external variables. The second machine described is an associative file processor. This processor rapidly searches a data base, simultaneously against many descriptors. The processor uses an inexpensive disc memory for record storage. It allows variable record lengths with simple insertion, deletion, or modification of stored records. It allows equality research, limit search, or between limits search on all descriptors within input queries. Block diagrams, command sets, and logic descriptions are given for each processor. Each processor is programmed to accomplish its intended tasks. Applications for each processor are described. (Author)

AD-621 519 **See Fld. 15/4**

AD-621 520 Div. 30/2 ,8/2
CFSTI Prices: HC $6.00 MF $1.25
WESTINGHOUSE ELECTRIC CORP BALTIMORE MD
DISPLAY SWITCHING STUDY.
Final technical rept.,
by William C. Roberson. Aug 65, 217p. Contract AF30 602 3264 Proj. 5597 Task 559701
RADC , TR-65-125
Unclassified report

Descriptors: (*Display systems, Computer storage devices), (*Switching circuits, Display systems), Computer logic, Command + control systems, Electrolumines-cence

The signal distribution and switching problem is studied in large-scale discrete-element displays. This work would be used in developing a future

display development program. The investigation and design are described of the optimum approach for switching large-scale displays. Five different systems were considered with four of these being designed in detail. One of the four was shown to be superior for most display conditions. During the program a simulation computer program and a background generation computer program were considered and are recommended for further effort.

AD-621 542 Div. 30/2 ,20/5
CFSTI Prices: HC $4.00 MF $0.75
DAVID TAYLOR MODEL BASIN WASHINGTON D C
THE FLAME USER'S MANUAL,
by Elizabeth H. Cuthill, Sarah E. Kenady, Joanna W.Schot, and Barbara Gibson. Sep 65, 115p.
Rept. no. 1937
Proj. S R003 10 01
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Programming (Computers), Instruction manuals), (*Fuel burn up, Programming (Computers)), Simulation, Computer logic, Digital computers

A guide is given to the use of FLAME, a set of UNIVAC-LARC codes designated FLAME 1, FLAME 2, and FLAME 3, each of which consists of many routines programmed for use in various combinations to solve a variety of steady-state and time-dependent problems involved in predicting the behavior of nuclear reactors. After briefly describing the two- and three-dimensional problems which are solved, a detailed explanation of the preparation of input data for each type of problem is given, along with typical input forms. The overall program logic and the functions performed by the routines comprising each major part of the code are also described. Input and edited output for several sample problems are given in the appendixes. (Author)

AD-621 577 Div. 30/2 ,25/4
CFSTI Prices: HC $3.00 MF $0.75
GENERAL ELECTRIC CO SUNNYVALE CALIF COMPUTER LAB
A STUDY OF CHARACTER RECOGNITION PARAMETER ANALYSIS.
Final technical rept. for Jul 64-Jul 65,
by Harold S. Vitale. Sep 65, 83p. Contract AF30 602 3488 Proj. 5591
RADC , TR-65-282
Unclassified report

Descriptors: (*Character recognition, Reading machines), (*Reading machines, Character recognition), (*Artificial intelligence, Reading machines), (*Optical scanning, Reading machines), Printing, Resolution, Computer logic, Pattern recognition, Bionics

An adaptive measurement technique for classifying the quality of printed text encountered in applications of optical print reading machines is presented. The measurement technique utilizes the learning properties of adaptive threshold logic. The convergence rate of the adaptive process is taken as a figure-of-merit for classifying print quality. Rapid convergence is associated with good quality printing while slow convergence is an indication of poor quality. A review of adaptive threshold logic is presented as an aid for describing the measurement technique. To implement the technique, threshold logic is simulated with the aid of a digital computer and highresolution images of actual printed text are used as input patterns. The measurement technique is verified and demonstrated by classifying various categories of printed text. The figure-of-merit measurements for each print category are catalogued with an accompanying representative print sample. It is expected that this catalog can be utilized as a comparative aid for estimating the figureof-merit of printed text encountered in applications of automatic print readers. (Author)

AD-621 584 **See Fld. 22**

AD-621 586 **See Fld. 4/2**

9/3. ELECTRONIC AND ELECTRICAL ENGINEERNG

AD-620 826 Div. 8/3
CFSTI Prices: HC $2.00 MF $0.50
INTERFERENCE TESTING AND RESEARCH LAB INC BOSTON MASS
STUDY AND EVALUATION OF RADIO FREQUENCY GROUNDING SYSTEMS.
Final rept.
6 Dec 60, 32p. Contract NBy17828
Unclassified report

Descriptors: (*Ground (Electrical), Radiofrequency), Electronic equipment, Electronics

An R.F. earth ground, per se, should not be required in an electronic system if the system has been properly designed, installed and maintained - except where an earth ground system is a functioning part of an electronic system. The only justification and need for conducting R.F. energy to an earth ground would be when all the electromagnetic energy, within an electric or electronic system, has not been completely utilized and other means for control, including such conventional techniques as filtering, relocation of equipment, tuning circuitry and shielding, have been found uneconomical or impractical. If the R.F. energy is then to be conducted to earth ground, modification of a conventional National Electrical Code (NEC) ground becomes necessary. As the stateof-the-art does not offer reliable methods for the control of electromagnetic energy by means of conduction to earth, such modifications therefore cannot always meet the exacting requirements for complete elimination or attenuation of this energy. Solutions are suggested to cope with unutilized R.F. energy. (Author)

AD-620 913 Div. 8/3
CFSTI Prices: HC $5.00 MF $1.00
TEXAS UNIV AUSTIN LABS FOR ELECTRONICS AND RELATED SCIENCE RESEARCH
TEXAS BIANNUAL OF ELECTRONICS RESEARCH, NO. 1.
Summary progress rept. for 1 Oct 64-31 Mar 65,
by Arwin A. Dougal. 15 May 65, 169p. Contract AF AFOSR766 65 Proj. 4751
AFOSR , 65-1715
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Electronics, Scientific research), Medical equipment, Information retrieval, Plasma physics, Atmosphere, Microwaves, Lasers, Terrestrial magnetism, Space flight

Research topics in progress, recent findings, and future plans in the areas of biomedical electronics; information sciences; physical, quantum, and plasma electronics; and space, atmospheric, and earth radio sciences are presented.

AD-620 956 Div. 7/2
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO ELECTRIC POWER BRANCH
REACTOR SWITCHING TESTS OF A VACUUM CIRCUIT BREAKER, FARGO SUBSTATION MISSOURI RIVER BASIN PROJECT,
by G. W. Cleaveland, and C. U. T. Starkenberg.
2 Aug 65, 22p. Rept. no. EP-10
Unclassified report

Descriptors: (*Circuit breakers, Vacuum apparatus), (*Power equipment, Circuit breakers), Performance (Engineering), Transmission lines, Transients, Voltage, Switching circuits, Electric arcs, Tests

A 13.8-kv vacuum-type circuit breaker at Fargo Substation performed well on reactor switching tests, usually clearing at the first current zero after contact part (for the first contact to clear). Average arcing time for the 3 phases was 0.35 cycles. This new-type breaker shows no tendency to restriking but a slight tendency to current chopping with breaker operating at 84% of continuous current rating. Moderate overvoltage transients were recorded during closing operations. The tests demonstrate a very regular pattern of clearing by the 3 interrupters during point-on-cycle switching. This breaker can be expected to provide reasonably maintenance-free reactor switching service and reasonable life within its range of applicability. Since it has low interrupting capabilities (12,000 amp, symmetrical) its use would be limited normally to locations with fault currents at or below this amount. At stations with higher interrupting current capabilities, the advantages of a vacuum breaker can be used for reactor switching service if it is applied between the reactor and the reactor neutral or by protecting the circuit with fuses of adequate interrupting capabilities. Since these tests do not provide information on interrupter life or frequency of contact adjustment, the breaker should be left in service for further study. (Author)

AD-620 985 **See Fld. 17/7**

AD-621 031 **See Fld. 9/1**

AD-621 035 Div. 8/3 ,15/2
CFSTI Prices: HC $4.00 MF $0.75
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
EVALUATION TESTS FOR STATISTICAL ANALYZERS.
Final technical rept. for Jul 64-May 65,
by R. D. Kelly. Jun 65, 102p. Rept. no. MAC-403-05B
Contract AF33 615 1418 Proj. 1370 Task 137005
FDL , TR-65-93
Unclassified report

Descriptors: (*Statistical analysis, Signals), (*Signals, Statistical analysis), Instrumentation, Test methods, Test equipment (Electronic), Probability, Errors

This report describes a series of tests designed to evaluate the performance of statistical analyzers. The types of analyses that these analyzers typically perform and that must be evaluated are: (1) Instantaneous amplitude probability density, (2) Instantaneous amplitude probability distribution, (3) Negative instantaneous amplitude probability distribution, (4) Peak value probability density, (5) Expected number of maxima per unit time, (6) Expected number (total, positive, or negative) of threshold crossings per unit time, (7) Joint instantaneous amplitude probability distribution, (8) Joint instantaneous amplitude probability density, (9) Extreme value density, (10) Extreme value distribution. Tests with both periodic (sinusoidal and triangular) and random (broadband Gaussian, narrow band Gaussian, and clipped Gaussian) signal inputs are delineated for each of the above analysis modes. Tolerances on the output wave shapes of the periodic signal generators are described so that generators whose outputs will not contribute significantly to the measurement errors can be selected. It is suggested that the random test signals be recorded on magnetic tape so that the identical signals can be analyzed by the statistical analyzer and a digital computer. The digital computer analysis will accurately define the statistical properties of the actual test signal so that the problems associated with imperfections in the random noise generator and statistical uncertainty fluctuations can be avoided. The analytical derivation of all of the above statistical functions for sinusoidal input signals are included to illustrate the operating principles of this analyzer. (Author)

AD-621 039 See Fld. 9/2

AD-621 089 Div. 8/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
CAPACITIVE ERROR IN CURRENT COMPARATORS,
by Petar N. Miljanic. 6 Jul 64, 8p. Rept. no. NRC-8480
Unclassified report

Pub. in IEEE Transactions on Instrumentation and Measurement vIM-13 n4 p210-6 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electric currents, Measuring devices (Electrical + electronic)), (*Audio frequency, Electric currents), (*Measuring devices (Electrical + electronic), Electric currents), Theory, Errors, Magnetic fields, Electromagnetic shielding, Capacitance, Wiring diagrams

The equations for the capacitive error of various constructions of audio-frequency current comparators are derived and discussed. The experimental procedure for trimming a comparator using an excitation winding is presented. The interrelationship between sensitivity and accuracy is indicated. An approximate diagram showing the size and error as a function of rated current for a matched sensitivity-error design is given. (Author)

AD-621 098 See Fld. 9/1

AD-621 102 Div. 7/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
THE PRECISE MEASUREMENT OF CURRENT RATIOS.
Revised ed.,
by Norbert L. Kusters. 2 Nov 64, 13p. Rept. no. NRC-8481
Unclassified report

Pub. in IEEE Transactions on Instrumentation and Measurement vIM-13 n4 p197-209 Dec 64 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 24 Jun 63.

Descriptors: (*Transformers, Calibration), (*Electric currents, Measurement), Circuits, Performance (Engineering), Direct current, Electrical impedance, Magnetic materials, Coils, Canada

The development of the current comparator, a threewinding current ratio transformer, is reviewed and its characteristics as an alternating current ratio standard are analyzed. Particular attention is given to the use of magnetic shielding and its effect on the accuracy and usefulness of the device. Some error characteristics of three types of audio-frequency current comparators are given and possible applications discussed. These include the calibration of current transformers and impedance comparisons. The adaptation of this device to dc operation is made possible by modulation techniques. A 20 000-ampere selfbalancing direct current comparator, designed specifically for the calibration in situ of transductors or direct current transformers, is described. The application of this comparator to the calibration of shunts at high currents also is discussed and some results presented. (Author)

AD-621 134 Div. 7/3 ,25/3
DUKE UNIV DURHAM N C DEPT OF ELECTRICAL ENGINEERING
ANALYSIS OF FIELDS IN ANISOTROPIO MEDIA WITH APPLICATION TO THE ANISOTROPY TRANSFORMER,
by T. C. Pilkington, and R. B. Roe. 13 Apr 65, 2p.
AROD , 5115:1
Unclassified report

Pub. in Proceedings of the IEEE, v53 n6 p653-4 Jun 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Transformers, Anisotropy), (*Field theory, Dielectrics), Differential equations, Capacitance

A method is presented for obtaining rapid solutions to problems involving anisotropic media. This technique is applied to the analysis of gadsden's anisotropy transformer.

AD-621 149 See Fld. 9/1

AD-621 191 See Fld. 14/2

AD-621 250 See Fld. 9/1

AD-621 252 Div. 8/3 ,30/3
CFSTI Prices: HC $6.00 MF $1.25
AIRBORNE INSTRUMENTS LAB MELVILLE N Y
TRANSMISSION-LINE MEASUREMENT TECHNIQUES.
Final rept. for 1 Mar 64-1 Apr 65,
by David S. Levinson. Aug 65, 255p. Rept. no. 3746-1
Contract AF30 602 3292 Proj. 4540 Task 454001
RADC , TR-65-187
Unclassified report

Descriptors: (*Probes (Electromagnetic), Transmission lines), (*Transmission lines, Probes (Electromagnetic), (*Waveguides, Probes (Electromagnetic)), (*Radiofrequency power, Measuring devices (Electrical + Electronics)), Radiofrequency spectroscopy, Antenna radiation patterns, Wave transmission, Electromagnetic properties, Measurement

The capabilities and performance of the multimode power-measuring technique have been expanded and improved. New measurement techniques and equipment that have been developed include a directional probe coupler for the measurement of multimode incident power into an arbitrary termination, a technique for determining the individual modes propagating in overmoded waveguide, and techniques for predicting the far-field radiation pattern of overmoded antennas. The addition of new components facilitate accurate frequency tuning and receiver input level adjustment, thereby facilitating operation for more rapid power measurements. All new components and improved measurement procedures were evaluated during two field tests performed in May 1964 and January 1965. The tests were conducted by performing in-guide spectrum-signature measurements on an operational AN/FPS-6 height-finding radar. Both directional and nondirectional in-guide power measurements were performed. The results of these tests showed that the multimode power-measuring equipment can be used in practical field applications to obtain useful information on the spurious-emission characteristics of transmitters. (Author)

AD-621 260 Div. 8/3 ,8/2
TECHNION ISRAEL INST OF TECH HAIFA
LOGICAL DESIGN OF TERNARY SWITCHING CIRCUITS,
by M. Yoeli, and G. Rosenfeld. 4 Sep 63, 11p.
Contract AF EOAR65 63 Proj. 9749 Task 974901
AFOSR , 65-1361
Unclassified report

Pub. in IEEE Transactions on Electronic Computers vEC14 n1 p19-29 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Switching circuits, Synthesis), Electronic switches, Voltage, Computer logic, Digital systems, Algebra, Electrical engineering, Topology

A logical design theory for ternary voltage switching circuits is developed. The theory is based on familiar binary switching circuit elements and simplification methods. The theory thus leads to simple electronic realization. The basic system of ternary switching elements consists of function realizable by means of either diode gates or a single triode (transistor). Various simplification methods for combinational circuits are described, namely a map method and two algebraic methods. The first algebraic method is an adaptation of the Quine method for determining the prime implicants of a given binary function, and the second is a modification of the Scheinman binary method. (Author)

AD-621 324 Div. 8/3 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
TAPERED DISTRIBUTED RC NETWORKS WITH SIMILAR IMMITTANCES.
Scientific rept.,
by John J. Kelly, and Mohammed S. Ghausi. Jun 65, 23p. Rept. no. SR-17 ,TR-400-114
Contract AF19 628 379 Proj. 5628 Task 562806
AFCRL , 65-525
Unclassified report

Descriptors: (*Admittance, Networks), (*Integrated circuits, Admittance), (*Networks, Admittance), (*Electrical engineering, Networks), Electromagnetic properties, Mathematical models, Differential equations

In this paper the poles and zeros of the two-port short-circuit admittance parameters of a class of tapered distributed RC networks are discussed. They are shown to be the zeros of an orthogonal set of solutions of the network differential equation. When the differential equation is written in Normal Form, it is possible to define a class of tapered networks which have closed form solutions and similar pole-zero patterns. This class is shown to include the uniform, exponentially tapered, hyperbolic, square and trigonometric tapered distributed RC networks. (Author)

AD-621 337 Div. 8/3 ,8/2
CFSTI Prices: HC $3.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
DIODE PARAMETER MATCHING FOR APPLICATION TO VARIABLE GAIN CONTROL,
by Richard S. Hughes. Sep 65, 52p. Rept. no. NOTS-TP-3819
Task TA M3781 001 216 1WW115 00 001
NAVWEPS , 8750
Unclassified report

Descriptors: (*Tuning devices, Diodes (Semiconductor)), (*Diodes (Semiconductor), Tuning devices), (*Variable resistors, Diodes (Semiconductor)), Silicon, Electromagnetic properties, Automatic gain control, Gain, Attenuation, Attenuators, Amplifiers, Impedance matching, Theory, Experimental data

The theoretical diode equation is studied with respect to parameter variations on the characteristic curve. Presented is the practical diode and its characteristics related to those of the theoretical diode. Also presented is the necessary parameter match for the theoretical diode that ensures a given gain or attenuation match between two amplifiers or attenuators. (Author)

AD-621 381 Div. 7/2 ,31/3
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
COMPRESSED RUBBER JUNCTION BOX FOR UNDERWATER USE,
by H. L. Grant. 3 Nov 64, 4p. Rept. no. reprint 65-5
Unclassified report

Pub. in Deep-Sea Research v12 p221-3 1965 (Copies available only to DDC users).

Descriptors: (*Junction boxes, Underwater equipment), Rubber, Moistureproofing, Canada

A method is described for making underwater connections in a space filled with compressed rubber. The box is easy to open and connections can be altered without special tools. Each conductor is individually sealed. The box can be made in any small machine shop. (Author)

AD-621 564 See Fld. 8/10

9/4. INFORMATION THEORY

AD-620 881 Div. 8/7 ,15/1
CFSTI Prices: HC $4.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A GENERALIZED MELLIN TRANSFORM FOR THE ANALYSIS OF LEARNING MACHINES.
Technical rept.,
by Bruce Allen Dolan. 1965, 137p. Rept. no. AFIT-TR-65-9

Unclassified report

Descriptors: (*Communication theory, Statistical analysis), (*Integral transforms, Artificial intelligence), (*Artificial intelligence, Integral transforms), Probability, Adaptive communication systems, Detectors, Signal-tonoise ratio

This work introduces a generalization of the Mellin integral transform, and then applies it as a new technique for the analysis of statistical learning machines. Specifically, this transform technique is demonstrated for Bayes' estimation and binary detection of communication signals in the framework of statistical decision theory. It is shown that the use of the Mellin transform markedly simplifies the analysis of sequential estimation of an unknown parameter in a statistical population, whether or not an optimum (admissible) decision rule is used for processing the observations. The loss function, which need not be error-squared, or the likelihood ratio is treated as a random variable, and is described by a transform expression derived from the basic Bayes' learning or estimation equation. This transform expression for the loss is the Mellin transform pair to the probability density of the loss, and contains, as unspecified parameters, the number of observations, the a priori assumptions about the unknown parameter that is to be estimated, and the decision (data processing) rule. The transform expression for the loss is shown to be a convenient and appealing measure of the performance of the learning machine. Convergence, bias, and the rate of convergence of the estimation procedure are readily displayed through the transform associated with the loss function. The average cost of errors for a binary detector, previously adapted through the use of sequential estimation, is derived through the convolution integral and Parseval's relationships for the Mellin transform. (Author)

AD-620 927 Div. 8/7
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
LINEAR AND NONLINEAR FILTERING THEORY,
by Richard S. Bucy. Sep 65, 16p. Rept. no. RM-4735-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Filters (Electromagnetic wave), Theory), Signal-to-noise ratio, Stochastic processes, Linear systems, Nonlinear systems, Communication theory

This paper is a written version of a talk to be given on problems of filtering theory. It is a review of the linear theory and some of the recent fundamental advances in the nonlinear theory. Some open and quite interesting problems in the nonlinear theory are discussed. (Author)

AD-621 001 Div. 8/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A DECODING PROCEDURE FOR TRIPLE-ERROR CORRECTING BOSE-CHAUDHURI CODES,
by E. L. Blokh. 27 May 65, 17p. Rept. no. FTD-TT-65-525
TT , 65-63926

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Tekhnicheskaya Kibernetika n3 p30-7 1964.

Descriptors: (*Decoding, Corrections), (*Coding, Errors), Communication theory, USSR

A method is presented for simplifying the most difficult operation when decoding Bose-Chaudhuri codes, associated with the determination of the positions in which errors took place if the number of errors is no greater than 3. (Author)

AD-621 009 Div. 8/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF AUTOMATIC OPTIMIZATION OF THE RATE OF DISCREET INFORMATION TRANSFER ALONG A COMMUNICATIONS CHANNEL WITH A VARIABLE SIGNAL/NOISE RATIO,
by A. A. Levin, and V. E. Khazatskii. 27 May 65, 5p. Rept. no. FTD-TT-65-489
TT , 65-63934

Unclassified report

Unedited rough draft trans. of Russian patent 161 351, pub. 7 Jun 62, appl. 781730/26-24, 1p.

Descriptors: (*Communication theory, Data transmission systems), (*Data transmission systems, Communication theory), Signal-to-noise ratio, Optimization, Synchros, Feedback, Errors, USSR

The proposed method is based on the use of feedback in order to expose errors in received data, a stepwise reduction in transmission rate and increase in the energy of elementary signals upon the appearance of errors. When there are no errors in the reception of data, as it appears on the basis of the feedback signal, and increase in transmission rate and a corresponding decrease in the energy of elementary signals take place according to a time program previously determined for the given communications channel on the basis of statistical data.

AD-621 202 Div. 8/7
LINCOLN LAB MASS INST OF TECH LEXINGTON
DISCUSSION OF 'ESTIMATION OF A SYSTEM PULSE TRANSFER FUNCTION IN THE PRESENCE OF NOISE',
by Lyle E. McBride, and Morris J. Levin. 28 Sep 64, 2p. Rept. no. JA-2292A
Contract AF19 628 5167
ESD , TDR-65-320

Unclassified report

Pub. in IEEE Transactions on Automatic Control, vol. AC-10 n2 p214-5 Apr 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Networks, Theory), (*Communication theory, Signal-to-noise ratio), (*Signal-to-noise ratio, Communication theory), Functions, Linear systems, Vector analysis, Electromagnetic pulses, Electrical engineering

A discussion by L. E. McBride of M. J. Levin's paper 'Estimation of a System Pulse Transfer Function in the Presence of Noise' (IEEE Trans. on Automatic Control, vol AC-9, Jul 1964, pp 229-235) and author's reply to the discussion.

AD-621 323 Div. 8/7
CFSTI Prices: HC $3.00 MF $0.75
NEW YORK UNIV N Y LAB FOR ELECTRO-SCIENCE RESEARCH
WORD-SELECTION PROCEDURES FOR ERROR-FREE COMMUNICATION SYSTEMS.
Scientific rept.,
by John J. Metzner, and Kenneth C. Morgan. Jun 65, 82p. Rept. no. SR-2 ,TR-400-113
Contract AF19 628 4321 Proj. 4610 Task 461003
AFCRL , 65-461

Unclassified report

Descriptors: (*Communication systems, Feedback), (*Communication theory, Data transmission systems), (*Data transmission systems, Communication theory), Vocabulary, Selection, Errors, Corrections, Data storage systems, Computer logic, Decision theory, Queueing theory

This report describes three alternative sets of rules, or procedures, capable of regulating the flow of message words in a feedback communication system - the circulating memory procedure, the interlace procedure, and the 'go back' procedure. The first two of these have been mentioned briefly in previous reports and the third has been described elsewhere. The procedures are evaluated and compared with respect to complexity and storage requirements, operational logic, and compatibility with cumulative decision techniques. A preliminary study of their effect on transmission time and hence on system efficiency is also presented. (Author)

AD-621 354 Div. 8/7 ,32/3 ,30/2
ARIZONA UNIV TUCSON
PROBLEMS OF TRANSFERENCE OF MEANING IN AUTOMATED TECHNIQUES,
by James W. Perry. 1964, 21p. Contract AF AFOSR62 289 Proj. 9769
AFOSR , 65-1169

Unclassified report

Presented at the Institute in Technical and Industrial Communications, Colorado State Univ., Fort Collins, Colo., 6-10 Jul 64 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Social communication, Automation), (*Communication theory, Analysis), (*Communication systems, Effectiveness), Culture, Computers, Data processing systems, Language, Information retrieval, Time

Applications of automated techniques to facilitate transference of meaning present widely different problems which can be characterized in terms of various barriers to communication, i.e., culture, symbols, space, and time. Two questions are presented: (1) How can logically defined automation techniques be applied to advantage in dealing with communication problems whose logical analysis remains only partial; and, (2) How shall we conduct the analysis of communication problems so that the results may provide the most effective possible guidance in planning and applying automation technique. Pragmatic answers to these questions are sought through discussion of the four communication barriers. (Author)

AD-621 421 See Fld. 14/5

AD-621 486 Div. 8/7
CFSTI Prices: HC $3.00 MF $0.75
PARKE MATHEMATICAL LABS INC CARLISLE MASS
EIGHTEEN HUNDRED SELECTED TWO-WORD CODES.
Scientific rept.,
by E. Myrvaagnes. Jul 65, 81p. Rept. no. SR-3
Contract AF19 628 3826 Proj. 5628 Task 562801
AFCRL , 65-597

Unclassified report

Descriptors: (*Coding, Errors), Corrections, Communication theory, Decoding

A list is given of some 1800 two-word binary codes with word length up to eight, with information about their capabilities for error-correction and for decodability with finite delay, of interest for theoretical studies and for the construction of larger codes. (Author)

9/5. SUBSYSTEMS

AD-620 812 See Fld. 10

AD-620 872 Div. 8/1 ,6/6 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
LINCOLN LAB MASS INST OF TECH LEXINGTON
RADIOMETER DATA PROCESSING IN THE HAYSTACK ANTENNA POINTING SYSTEM.
Technical note.
by Paul Stylos. 29 Jul 65, 64p. Rept. no. TN-1965-14
Contract AF19 628 5167
ESD, TDR-65-314

Unclassified report

Descriptors: (*Space surveillance systems, Parabolic antennas), (*Parabolic antennas, Positioning devices (Machinery)), (*Antenna radiation patterns, Data processing systems), (*Data processing systems, Antenna radiation patterns), Light homing, Celestial guidance, Radiometers, Programming (Computers), Real time, Digital computers

Since Radiometric methods are used to boresight the Haystack System, the Univac 490 antenna pointing system includes a radiometer data processing program which operates in real time concurrently with the antenna pointing programs. The main input to the program is comprised of 30-bit data words passed from the radiometric equipment to the computer via channel 5. Each word contains indentification bits allowing the computer program to distinguish between two different types of data: 'auxiliary' or 'radiometric'. The processing of the auxiliary data consists of a simple check to determine if data associated with a particular identification falls within specified bounds for that identification. This data is then logged on the highspeed printer, along with its associated upper and lower limits, and an indication if the data is outside of the specified limits. Processing of the radiometer data is more complex; in general, the primary output is a running measure of radiometric source temperature. The results of this processing are both logged and plotted on the high-speed printer in real time.

AD-620 934 Div. 8/1 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
SYRACUSE UNIV RESEARCH INST N Y DEPT OF ELECTRICAL ENGINEERING
RADIATION FROM AN AXIALLY SLOTTED ANISOTROPIC PLASMA-CLAD CYLINDER.
Interim technical rept.,
by Hollis H. C. Chen, and David K. Cheng. Aug 65, 32p. Rept. no. EE-957-6505T12
Contract AF30 602 2646 Proj. 4506 Task 450604
RADC, TR-65-215

Unclassified report

Descriptors: (*Antenna radiation patterns, Plasma sheath), (*Plasma sheath, Antenna radiation patterns), Cylindrical bodies, Plasma physics, Numerical analysis

This report presents an analytical solution for the radiation field of an axially slotted, infinite, circular cylinder which is covered with a uniform layer of an anisotropic plasma sheath. Numerical results are obtained and radiation patterns plotted for various degrees of plasma anisotropy. It is shown that the radiation pattern undergoes rapid changes for certain ranges of plasma parameters and forms well-defined, directive beams for other ranges. Curves showing the effect of the thickness of the plasma sheath on the radiation characteristics are also given. (Author)

AD-620 951 Div. 7/5 ,26/8 ,27/2 ,27/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
COMBINED OSCILLATIONS OF WORK VANES AND DISCS IN A TURBODYNAMO,
by S. I. Bogomolov. 18 Jun 65, 19p. Rept. no. FTD-TT-65-580
TT, 65-63905

Unclassified report

Unedited rough draft trans. of Energomashinostroenie (USSR) v11 n2 p7-11 1965.

Descriptors: (*Turbine blades, Oscillations), (*Dynamotors, Turbine blades), Compressors, Gas turbines, Steam turbines, Differential equations, Equations, Digital computers, USSR

This article presents a method for calculating the frequency and form of the simultaneous oscillations of the working vanes and discs of a turbodynamo taking into account all of the basic factors which have an effect on their oscillation, and certain computational results are carried out using the M-20 computer.

AD-621 004 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A THREE-ARM FERRITE UHF CIRCULATOR,
by E. G. Ritter. 17 Jun 65, 5p. Rept. no. FTD-TT-65-196
TT, 65-63929

Unclassified report

Unedited rough draft trans. of Russian patent 163 228, pub. 2 Jun 62, appl. 781385/26-9, 2p.

Descriptors: (*Waveguide circulators, Ultrahigh frequency), USSR, Patents, Ferromagnetic materials, Spheres, Magnetic fields, Ferrites, Polarization, Waveguide windows

The object of the invention is a three-arm ferrite UHF circulator in which for the control of the energy of the UHF by means of conversion of linear polarization into circular, and also for reducing the dimensions of the communication window there is placed in it a ferrite sphere. The sphere is magnetized by a magnetic field, longitudinal for the one of the wave guides.

AD-621 047 Div. 8/1
CFSTI Prices: HC $1.00 MF $0.50
TECHNICAL UNIV OF DENMARK LYNGBY LAB OF ELECTROMAGNETIC THEORY
EXPERIMENTAL INVESTIGATION OF A LINEAR VAN ATTA REFLECTOR.
Scientific rept.,
by J. Appel-Hansen. May 65, 19p. Rept. no. SR-3 ,R-46
Contract AF61 052 794
AFCRL, 65-593

Unclassified report

Descriptors: (*Electromagnetic wave reflection, Dipole antennas), (*Reflectors, Dipole antennas), Antenna radiation patterns, Phased arrays, Antenna components, Coupled antennas

An experimental investigation of a linear Van Atta reflector consisting of four half-wave dipoles was made in a radio-anechoic box. In agreement with a theoretical and numerical investigation, the experiments show that the reflector has the effect stated in Van Atta's patent description only to a limit extent. It was confirmed that maximum reflection in many cases is not back in the direction of incidence and that the reflector has a mirror effect to the same extent as it has the Van Atta effect. Furthermore it was verified that for certain lengths of transmission lines and angles of incidence there is no reflected field. Asymmetries in the reradiation patterns were observed which, according to theory, are due to mutual coupling between the dipoles. (Author)

AD-621 048 Div. 8/1
CFSTI Prices: HC $2.00 MF $0.50
TECHNICAL UNIV OF DENMARK LYNGBY LAB OF ELECTROMAGNETIC THEORY
REFLECTOR ARRAYS.
Annual summary rept.,
by Tove Larsen. Apr 65, 28p. Rept. no. R-45
Contract AF61 052 794
AFCRL, 65-572

Unclassified report

Descriptors: (*Phased arrays, Reflectors), (*Reflectors, Electromagnetic waves), Antenna radiation patterns, Dipole antennas, Antenna components, Transmission lines, Linear systems, Scattering, Electrical impedance

A scheme for a theoretical investigation of an arbitrary Van Atta reflector with or without a conducting plate is given. A four element linear reflector consisting of half wave dipoles has been given special attention. The reradiation pattern of such reflector has been examined analytically and numerically and the theoretical results have been confirmed by experiment. It is found that a Van Atta reflector do not always behave as stated in the patent description. (Author)

AD-621 087 Div. 8/1 ,8/6 ,2/7
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
ROCKET ANTENNA VOLTAGE BREAKDOWN IN THE UPPER ATMOSPHERE,
by F. V. Cairns. 30 Mar 65, 5p. Rept. no. NRC-8507

Unclassified report

Pub. in Canadian Journal of Physics v43 p1558-61 Aug 1965 (Copies available only to DDC users).

Descriptors: (*Rocket antennas, Sounding rockets), (*Sounding rockets, Rocket antennas), Upper atmosphere, Radiofrequency power, Antenna radiation patterns, Signal-to-noise ratio, Telemeter systems, Meteorological instruments

AD-621 163 Div. 7/5 ,30/3
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
SLIDING ELECTRICAL CONTACTS FOR ULTRAHIGH VACUUM,
by Francis J. Clauss. 29 Mar 65, 1p. Contract AF40 600 1070

Unclassified report

Pub. in Review of Scientific Instruments v36 n8 p1251 Aug 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Vacuum apparatus, Electrical conductance), (*Electrical conductance, Vacuum apparatus), Silver, Copper, Molybdenum compounds, Sulfides, Graphite

A new sliding contact material was developed that is a composite of silver, copper, and molybdenum disulfide and it is produced by powder metallurgy techniques. Tests at 10 to the -9th power Torr demonstrate that this material can operate at current densities up to at least 300 A/sq in, sliding velocities up to at least 18 cm/sec, and brush contact pressure from 422-704 g/sq cm (6-10 psi). The electrical noise characteristics of the material in either air or vacuum are similar to those of conventional silver-graphite contacts in air. Ring wear was negligible with the new material, whereas the silver-graphite brushes caused deep scratching and undercutting. Electrical noise with the new

material was fairly constant at a value between 2.5 and 5 mV throughout the test (noise measured as peak noise on an oscilloscope). Electrical noise with the silver-graphite brushes became progressively higher with the time of operation and had reached 200 mV at the end of 700 h in vacuum.

AD-621 170 See Fld. 10

AD-621 210 Div. 8/1
MITRE CORP BEDFORD MASS
MODE THEORY APPROACH TO ARRAYS,
by R. H. T. Bates. 28 Sep 64, 2p. Contract AF19 628 2390
ESD , TR-64-91
Unclassified report

Pub. in IEEE Transactions on Antennas and Propagation vAP13 n2 p321-2 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Phased arrays, Electromagnetic fields), Performance (Engineering), Radiofrequency power, Scanning, Waveguides, Graphics, Wave transmission, Gain, Antenna radiation patterns, Electrical impedance

The paper suggests that the radiating and evanescent modes which make up the electromagnetic field of any array is better than the mutual impedance approach for diagnosing the causes of unsatisfactory array performance.

AD-621 250 See Fld. 9/1

AD-621 350 See Fld. 10

AD-621 371 See Fld. 9/1

AD-621 474 Div. 8/1 ,2/7
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
A CIRCULAR SLOT ANTENNA FOR USE ON IONOSPHERIC PROBES.
Scientific rept.,
by B. N. Cuffin. 15 Sep 65, 70p. Rept. no. SR-249
Contract DA ARO D31 124G659
Unclassified report

Descriptors: (*Slot antennas, Atmospheric sounding), Antenna radiation patterns, Analysis, Mathematical prediction, Electric fields, Performance (Engineering), Ionosphere

An analysis of an empirically designed circular slot antenna is presented. The radiation patterns of the actual antenna are shown and compared to the patterns predicted by a theoretical model that is developed. Possible reasons for some of the difference between the results are indicated. (Author)

AD-621 499 Div. 8/1 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
UTAH UNIV SALT LAKE CITY UPPER AIR RESEARCH LABS
THE THEORY OF CYLINDRICAL ANTENNA IMPEDANCE AS A FUNCTION OF PLASMA FREQUENCY AND TEMPERATURE.
Scientific rept.,
by Alvin M. Despain. 3 Mar 65, 44p. Rept. no. SR-1
Contract AF19 628 4995 Proj. 7663 Task 766303
AFCRL , 65-480
Unclassified report

Descriptors: (*Antennas, Cylindrical bodies), (*Electrical impedance, Antennas), (*Plasma physics, Antennas), Electron density, Temperature, Probes (Electromagnetic), Resonance, Programming (Computers)

A theory of the rf impedance of a short isolated cylindrical antenna in a plasma is developed. The results indicate a series resonance exists below the plasma frequency where a parallel resonance exists. This series resonance, and indeed the complete impedance function, was found to depend upon the electron temperature, plasma frequency and the antenna physical parameters. Several examples are illustrated. (Author)

AD-621 555 Div. 8/1
CFSTI Prices: HC $4.00 MF $0.75
PHILCO CORP BLUE BELL PA ADVANCED TECHNOLOGY CENTER
ADVANCED ANTENNA TECHNIQUES.
Scientific rept. no. 1, 26 Oct 64-26 Jun 65,
by Leo W. Procopio, Thomas K. Kashihara, and Stephen Czorpita. Jul 65, 103p. Contract AF19 628 4769 Proj. 4600 Task 460006
AFCRL , 65-551
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Antenna configurations, Theory), Antenna radiation patterns, Statistical functions, Correlation techniques, Synthesis, Phased arrays, Resolution, Dipole antennas, Phase shift

The results of preliminary investigations into antenna techniques which employ the angular dispersion-compression principle are presented. The report includes a description of various processing schemes, including detailed discussion of the cylindrical disc array, and a study of the general synthesis problem for ambiguity functions. In the latter study, the use of pseudo-random illumination functions is analyzed as a means for achieving dispersed patterns and good pattern correlation properties. The report also presents additional studies in superdirectivity and angular resolution. The problem of synthesizing a superdirective illumination function for a plane, circular aperture is presented and is shown to be closely approximated by the field distribution of a circular confocal cavity. The resolution constants associated with angle rate, and combined angle-angle rate are derived; resolution in angle-rate is found to depend only on the spatial spread of the pattern, while resolution in combined angle-angle rate is found to be a constant, indicating a fundamental tradeoff between resolution in angle and that in angle rate. Finally, the six dimensional resolution constant, containing the parameters range, azimuth, elevation, and their respective rates of change, is discussed. It is shown that for a particular set of assumptions regarding antenna processing, the six dimensional resolution hyperspace is a constant. (Author)

AD-621 581 See Fld. 12/1

AD-621 594 See Fld. 20

10. ENERGY CONVERSION (NON-PROPULSIVE)

AD-620 812 Div. 7/6 ,7/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
AUTONOMOUS ASYNCHRONOUS GENERATOR HAVING EXCITATION FROM VARICONDS (VARIABLE CAPACITORS),
by I. A. Popov. 1 Jun 65, 12p. Rept. no. FTD-TT-65-384
TT , 65-63855
Unclassified report

Unedited rough draft trans. of Elektrotekhnika (USSR) v35 n11 p41-4 1964.

Descriptors: (*Generators, Variable capacitors), (*Variable capacitors, Generators), Experimental data, Ceramic capacitors, USSR

Variconds permit a stabilization of the voltage for an asynchronous generator in the entire range of its load changes. The use of an contactless asynchronous generator, in the system, makes it reliable and convenient in operation. (Author)

AD-621 170 Div. 7/6 ,7/5 ,19/5
CFSTI Prices: HC $1.00 MF $0.50
WESTINGHOUSE ELECTRIC CORP LIMA OHIO AEROSPACE ELECTRICAL DIV
100 WATT THERMOELECTRIC POWER SYSTEM FOR BUOY APPLICATIONS.
Monthly progress rept. no. 15, 11 Aug-11 Sep 65,
by Dale A. Naumer. 11 Sep 65, 3p. Contract N600 61533 61992
Unclassified report

See also AD-611 397.

Descriptors: (*Thermoelectricity, Buoys), (*Buoys, Power supplies), Electric power production, Temperature control, Control systems, Thermocouples, Generators, Copper, Sintering, Marker lights

AD-621 276 Div. 7/6 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS
NON-EQUILIBRIUM IONIZATION USING ELECTROSTATIC PROBING TECHNIQUES.
Final rept. for 1 Mar 63-28 Feb 65,
by R. H. Bullis. 26 Apr 65, 41p. Rept. no. D-920072-6
Contract AF49 638 1221 Proj. 9752 Task 975201
AFOSR , 65-1241
Unclassified report

Descriptors: (*Thermionic converters, Plasma medium), (*Plasma medium, Electromagnetic probes), (*Electromagnetic probes, Plasma physics), Cesium, Ionization, Argon, Electrostatics, Electric arcs, Electrons, Temperature, Density, Pressure, Voltage

Research was conducted to determine the electron energy distribution in the cesium plasma in an arc-mode thermionic converter and to determine the changes in this distribution produced by the presence of a highly inert gas background pressure. Electrostatis probes were used to measure various plasma properties, such as electron energy distribution, electron number density, and plasma potential. Calculations were made of the plasma production and loss rates. A bibliography of the publications resulting from this work and reprints of the most recent papers covering portions of the research are included. (Author)

AD-621 350 Div. 7/6 ,7/5
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA MINING AND MFG CO ST PAUL
300 WATT PORTABLE THERMOELECTRIC GENERATOR.
Monthly progress rept. no. 11 for period ending 31 Aug 65,
by R. D. Carlton. 31 Aug 65, 6p. Contract N600 61533 62758
Unclassified report

See also AD-619 718.

Descriptors: (*Thermoelectricity, Power supplies), (*Generators, Thermoelectricity), (*Electric power production, Thermoelectricity), Portable, Thermocouples, Energy conversion, Heat exchangers, Wiring diagrams

The first prototype was reassembled for use as a test fixture for burner work. Modification of the burner has resulted in a considerable improvement in both hot and cold end temperature distribution. Final selection of auxilliary components has been made, and the electrical system design has been completed. Appropriate design changes have been made to accomplish the changeover from magnesium to aluminum follower blocks. (Author)

AD-621 454 Div. 7/6 ,7/1
CFSTI Prices: HC $4.00 MF $0.75
HARSHAW CHEMICAL CO CLEVELAND OHIO
RESEARCH ON PHOTOVOLTAIC CELLS.
Final rept. for 1 May 62-30 Apr 65,
by Norman E. Heyerdahl, and Donald J. Harvey.
Jun 65, 125p. Contract AF33 657 7916 Proj. 7885 Task 788502
ARL , 65-111

Unclassified report

See also AD-439 672.

Descriptors: (*Solar cells, Semiconducting films), (*Semiconducting films, Solar cells), Cadmium compounds, Sulfides, Selenium, Cadmium alloys, Selenium alloys, Tellurium alloys, Zinc alloys, Gallium alloys, Arsenic alloys, Chemical milling, Vapor plating, Magnetic properties, Electrical properties, Thermoelectricity, Light transmission

The report describes research and development on thin film solar batteries. The fabrication and study of thin films of CdS:Se, CdSe, CdTe, ZnSe, and GaAs and thin film solar batteries of CdS:Se, CdSe, and CdTe is discussed in detail. A study of the etching behaviour of II-VI compounds, completed as a part of this program, has been published elsewhere. An abstract of the work is included in this report. (Author)

10/3. ENERGY STORAGE

AD-621 080 Div. 7/1
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE AERO PROPULSION LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
INVESTIGATION OF SEMICONDUCTOR EQUALIZER DIODES FOR SECONDARY BATTERY CELLS,
by Wayne Scott Bishop. 1965, 25p.

Unclassified report

Descriptors: (*Alkaline cells, Performance (Engineering), (*Diodes (Semiconductor), Batteries + Components), Avalanche diodes, Germanium, Nickel, Cadmium, Battery chargers, Performance (Engineering), Storage batteries, Control

Cell unbalance and its effect on battery performance is discussed. This cell unbalance results from overcharging and reverse charging (overdischarge) of individual cells. The effects of these problems on premature battery failure are included. Techniques for circumventing these problems are outlined. A technique employing a zener diode for charge and overcharge control is presented in detail. Coupled with this zener diode is a high forward conductance germanium diode for overdischarge protection. Test data obtained using this diode technique on a three cell sealed nickel-cadmium battery is presented, and this data is compared to similar cells operating under the same conditions. The advantages and disadvantages of the diode technique are discussed and compared with other techniques of cell control. Projected battery weights using the diode equalizer system are discussed. (Author)

AD-621 454 See Fld. 10

AD-621 583 Div. 7/1
CFSTI Prices: HC $3.00 MF $0.75
YARDNEY ELECTRIC CORP NEW YORK
DEVELOPMENT OF THE SEALED ZINC-SILVER OXIDE SECONDARY BATTERY SYSTEM.
Quarterly progress rept. no. 7, 1 Jan-31 Mar 65,
by Martin Sulkes. 31 Mar 65, 51p. Rept. no. 574-65
Contract DA36 039AMC02238 Proj. DA3A99 09 022

Unclassified report

See also AD-453 792.

Descriptors: (*Storage batteries, Battery separators), (*Alkaline cells, Battery separators), (*Battery separators, Performance (Engineering)), Zinc, Silver, Oxides, Membranes, Clay minerals, Asbestors, Halocarbon plastics, Polyethylene plastics, Electrochemistry, Tests, Malfunctions, Surface-active substances

The use of an unfiltered power supply for charging increased capacity in comparison with a straight D. C. charge, particularly at high charge rates. Evaluation cycle data are presented for 32 cells from a factorial experiment which evaluates 7 separators, 2 KOH concentrations, 4 concentrations of Teflon binder, 3 Zn/Ag ratios and the effect of a negative interseparator. Poor results were obtained with various PVA and Borden methyl cellulose separators, particularly in 26.5% KOH. Finally, the rate of oxygen recombination was lowered by increasing the Teflon content in the negative and by decreasing the Zn/Ag ratio. Evaluation cycles and an overcharge test were run on 16 cells designed to determine the effect of surfactant additions to the negative and the effect of zinc penetration resistant separators on cell performance. Preliminary results indicate no loss of capacity with these additions. Initial results with cells built with RA12.2XH separator indicate good capacity and voltage. Oxygen recombination however, was low due to a lack of free space in the cell. (Author)

11/1. ADHESIVES AND SEALS

AD-620 820 Div. 14/1 ,26/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MOLYBDENUM-MANGANESE BASE PASTE FOR JOINING METAL WITH CERAMIC,
by I. I. Iskoldskii, M. A. Rubashov, A. E. Gorbunov, V. I. Kosyreva, and V. V. Stroganova. 25 Aug 65, 4p. Rept. no. FTD-TT-65-493
TT , 65-63863

Unclassified report

Unedited rough draft trans. of Russian patent 166 839, pub. 6 Feb 63, appl. 817784/22-2, 1p.

Descriptors: (*Adhesives, Powder alloys), (*Joining, Adhesives), Composite materials, Molybdenum, Manganese, Powder metals, Molybdenum alloys, Borium alloys, Silicon alloys, Metals, Ceramic materials, Sintering, Costs, Additives, Organic compounds

The object of the invention is a molybdenum manganese base paste for joining metal with ceramics. 5% powder of molybdenum boride/silicon alloy, taken in ratios of 1:1 or 3:1, is added to reduce the cost of the paste.

11/2. CERAMICS, REFRACTORIES, AND GLASSES

AD-621 423 See Fld. 20/13

11/3. COATINGS, COLORANTS, AND FINISHES

AD-620 918 Div. 14/7 ,31/4
CFSTI Prices: HC $1.00 MF $0.50
UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
PROTECTIVE COATINGS FOR DEEP SUBMERGENCE VESSELS.
Quarterly rept. no. 6, 6 Jun-5 Sep 65,
by A. S. Glowacki. 16 Sep 65, 15p. Contract NObs90246 Proj. SR007 03 04 Task 1008

Unclassified report

See also AD-617 604.

Descriptors: (*Moistureproofing, Laminates), (*Underwater equipment, Protective treatments), (*Plastic coatings, Underwater equipment), (*Epoxy plastics, Underwater equipment), Filament wound construction, Binders, Selection, Effectiveness, Aging (Materials), Amines, Anhydrides, High-pressure research, Pressure vessels, Isocyanate plastics

One flexible epoxy resin system was selected as a coating for filament-wound deep submergence vessels. The coating was applied to glass-reinforced plastic laminates and subjected to cyclic pressurization between atmospheric pressure and 7,000 psig. The amine-curing recipe was replaced by an anhydride-curing system with encouraging results. (Author)

AD-620 986 Div. 14/7 ,33/1
CFSTI Prices: HC $2.00 MF $0.50
NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER ATLANTIC CITY N J EXPERIMENTATION DIV
DEVELOPMENT OF RUNWAY MARKING MACHINE AND COLD-WATER PAINT FOR AIRPORT SURFACE MARKING.
Final rept.,
by Nathaniel H. Twichell. Apr 65, 29p. Proj. 421 26X
SRDS , RD-65-45

Unclassified report

Descriptors: (*Paint applicators, Runways), (*Paints, Runways), (*Runways, Paints), Tests, Design, Spray nozzles, Landing fields, Airports

A low-cost mobile spray unit was developed for applying experimental marking patterns on runway and taxiway surfaces. Speed of application and drying were essential since runway availability was critical; therefore, a cold-water paint was developed for use with the spray unit. The prototype paint spraying device was assembled from readily available stock components and tested. The cold-water airport paint, developed concurrently, proved compatible with the spray unit and possessed the required ease of handling and application qualities. Results of this prototype unit testing indicate that a mobile paint spraying device, similar to the type developed, would be well-suited to the task of marking runway and taxiway surfaces, particularly where frequent repainting of touchdown areas is necessary. (Author)

AD-621 064 Div. 14/7
CFSTI Prices: HC $2.00 MF $0.50
SPRINGFIELD ARMORY MASS
TEST RESULTS ON FALEX PINS COATED BY THE PLASMA-ARC PROCESS.
Technical rept.,
by Francis X. Hassion. 30 Jul 65, 28p. Rept. no. SA-TR18-1096
Proj. M1 3 23043

Unclassified report

Descriptors: (*Refractory coatings, Wear resistance), Molybdenum, Tungsten, Tungsten alloys, Carbon alloys, Cobalt alloys, Carbides, Friction, Stainless steel, Zirconium compounds, Oxides, Aluminum compounds, Cermets, Nickel, Surface properties

Coatings of nickel-alumina, molybdenum, tungsten, alumina, tungsten carbide-cobalt, stainless steel, and zirconia applied to Falex pins by the plasma-arc process were tested for wear resistance. The tungsten carbidecobalt, the tungsten, and the molybdenum coatings showed unusually good wear characteristics comparable to dispersions of diamond, zirconia, and thoria in chromium electroplate formed at high current densities. The coefficients of friction appeared to be somewhat higher in the plasma-arc coatings. This may be due, however, to the initial roughness of the surfaces tested. The other plasma-arc coatings, i.e., nickel-alumina, alumina, stainless steel, and zirconia either flaked, wore off, or galled under test. Procedures are described and results are discussed. (Author)

AD-621 546 Div. 14/7
CFSTI Prices: HC $1.00 MF $0.50
PREVENTION OF DETERIORATION CENTER NAS-NRC WASHINGTON D C
PROTECTIVE COATING SYSTEMS FOR NIOBI-

UM IN THE RANGE 1800 - 2500 F,
by R. G. Lyle. Jan 64, 23p. Rept. no. PDL-50205

Unclassified report

Descriptors: (*Niobium, Refractory coatings), (*Refractory coatings, Niobium), (*Bibliographies, Refractory coatings), Oxidation, Refractory metals, Refractory metal alloys, Coatings, Protective treatments, Vanadium alloys, Abstracting, Hightemperature research, Metal coatings

A bibliography giving pertinent references on 'Longtime high reliability coatings for 1800 to 2500 F columbium applications'. In addition to oxidation protection above 1800 F, information is given concerning ductility, flexibility, thickness, diffusional stability and resistance of coating systems to thermal shock and cycling, impact abrasion and vibration.

11/5. FIBERS AND TEXTILES

AD-620 819 Div. 14/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF OBTAINING POLYCARBONATE FIBER,
by A. A. Konkin, L. G. Vedernikova, and V. N. Kotrelev. 25 Aug 65, 5p. Rept. no. FTD-TT-65-495
TT , 65-63862

Unclassified report

Unedited rough draft trans. of Russian patent 166 808, pub. 24 Jan 64, appl. 878078/23-5, 1p.

Descriptors: (*Fibers (Synthetic), Polyester plastics), (*Polyester plastics, Production), Organic solvents, Chemical precipitation, Halogenated hydrocarbons, Alcohols, Patents, USSR

The object of invention is a method of obtaining polycarbonate fiber by forming a polymer in a solution of methylene chloride, distinguished by the fact that, for the purpose of creating soft conditions for formation and improvement in the quality of the fiber, formation of the fiber is carried out in a precipitating bath, consisting of methanol and methylene chloride. (Author)

AD-621 057 Div. 14/4 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
MODIFICATION OF THE PROPERTIES OF POLYPROPYLENE FIBERS,
by M. P. Zverev, R. A. Bychkov, T. F. Kostina, and V. S. Klimenkov. 29 Jun 65, 13p. Rept. no. FTD-TT-65-261
TT , 65-63942

Unclassified report

Unedited rough draft trans. of Khimicheskie Volokna (USSR) n3 p15-9 1964.

Descriptors: (*Fibers (Synthetic), Physical properties), (*Polyethylene plastics, Fibers (Synthetic)), (*Styrene plastics, Fibers (Synthetic)), Compatibility, Molecular structure, Crystals, Physical properties, Mechanical properties, Heat of activation, Creep, Stereochemistry, USSR

A study of the compatibility of the systems polypropylenepolystyrene showed that the positive values for the amount of contraction do not prove to be the criterion which determines the microcompatibility of crystalline polymers. The influence of the geometric dimensions of the macromolecules of the original polymers, and the different dimensions of the secondary formations with the shifting of the polymers, on the amount of contraction of the specific volume is pointed out. The fibers obtained from a mixture of isotactic crystalline polypropylene and polystyrene have satisfactory physico-mechanical properties up to the content of not more than 12% by weight of the polystyrene in the polypropylene. The energy of activation of creep increases with the increase in the content of polystyrene in the polypropylene. This is brought about by steric obstacles created by the polystyrene, which inhibit the shifting of the structures of the polypropylene. (Author)

AD-621 227 **See Fld. 20/6**

AD-621 544 Div. 14/4 ,16/2
CFSTI Prices: HC $4.00 MF $0.75
PREVENTION OF DETERIORATION CENTER NAS-NRC WASHINGTON D C
BIBLIOGRAPHY ON DEGRADATION OF TEXTILES BY MICROORGANISMS, WEATHERING AND ATMOSPHERIC POLLUTANTS,
by Richard W. H. Lee. 15 Dec 62, 109p. Rept. no. pdc search No. 62-051 ,PDL-45840

Unclassified report

Descriptors: (*Textiles, Degradation), Microorganisms, Biological contamination, Atmosphere, Air pollution, Materials, Laundering, Light, Chemical contamination, Fungus deterioration, Fungi, Bacteria, Fungusproofing, Weatherproofing, Antifouling coatings, Protective treatments, Finishes + finishing, Bibliographies

The bibliography is intended primarily as a guide to work done in the field of atmospheric deterioration of textile materials. Emphasis is placed upon the effects of microbiological agents, weathering, light, and air pollutants. Also included are materials relating to effects of soiling, chemicals, and certain deleterious effects associated with laundering. Excluded are papers dealing with soil burial and soil microorganisms, water resistance and waterproofing per se, and nuclear radiation. Papers listed are arranged in three categories: (1) Effects of microbiological agents; (2) Effects of light and weathering; and (3) Effects of chemicals and atmospheric pollutants.

11/6. METALLURGY AND METALLOGRAPHY

AD-620 816 **See Fld. 13/13**

AD-620 877 Div. 17/7
CFSTI Prices: HC $5.00 MF $1.25
AIR FORCE MATERIALS LAB AIR FORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB OHIO
OXIDATION OF TUNGSTEN AND OTHER REFRACTORY METALS.
Technical rept.
Apr 65, 197p. Rept. no. ML-TR-64-162
Proj. 7312 Task 731202

Unclassified report

Presented as Proceedings of Joint AIME/Air Force Materials Lab. Symposium on 31 Oct 62 in New York City. Held in conjunction with the Institute of Metals Div., American Inst. of Mining, Metallurgical, and Petroleum Engineers.

Descriptors: (*Tungsten, Oxidation), (*Refractory metals, Oxidation), (*Oxidation, Refractory metals), High-temperature research, Reaction kinetics, Oxides, Tantalum, Niobium, Refractory coatings, High-pressure research

Contents: Methods for studying high temperature oxidation reactions, High pressure oxidation of refractory metals - experimental methods and interpretation, Initial stages of the oxidation of tungsten and tantalum, Four types of oxidation processes in the oxidation of tungsten, The reactions of gaseous systems with tungsten at elevated temperature, Oxidation of tungsten at ultra-high temperatures, Oxidation behavior of tantalum and niobium at high temperatures, Basic factors in the design of protective coatings for tungsten.

AD-621 040 Div. 17/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF CORROSION RETARDATION FOR STEEL AND IRON IN ACIDS AT HIGH TEMPERATURES,
by R. N. Volkov, A. Ya. Shatalov, and S. A. Kononovich. 26 Aug 65, 5p. Rept. no. FTD-TT-65-770
TT , 65-63949

Unclassified report

Unedited rough draft trans. of Russian patent 162 739, pub. 16 Jul 63, appl. 847640/22-2, 1p.

Descriptors: (*Steel, Corrosion inhibition), (*Iron, Corrosion inhibition), (*Corrosion inhibition, Acids), Corrosive liquids, Temperature, Quinolines, Halogenated hydrocarbons, Chlorides

The object of the invention is a method of corrosion retardation for steel and iron in acids, at high temperatures. Chloride benzyl quinoline is added as an acid inhibitor. (Author)

AD-621 050 **See Fld. 20/12**

AD-621 051 Div. 17/2 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE QUESTION OF ORIGINATION OF RECRYSTALLIZATION CENTERS,
by V. N. Danilov. 25 Jun 65, 9p. Rept. no. FTD-TT-65-10
TT , 65-63951

Unclassified report

Unedited rough draft trans. of Akademiya Nauk URSE, Kiev. Dopovidi, n9 p1236-40 1960.

Descriptors: (*Recrystallization, Metals), USSR, Metallography, Silver, Iron, Microstructure, Crystal lattice defects, Diffusion

Metallographic investigations of silver and iron sample surfaces showed that the recrystallization begins as a rule, at the places of macro- and micro gradients of tension. If the appearance of a new subblock is understood as the formation of recrystallization center, then the screw dislocations at high temperatures may be recrystallization centers, since the growth of the atomic layers takes place around them. (Author)

AD-621 056 **See Fld. 20/12**

AD-621 063 **See Fld. 20/12**

AD-621 077 Div. 17/2 ,17/7 ,25/2
CFSTI Prices: HC $2.00 MF $0.50
UNIVERSIDAD NACIONAL DE CUYO SAN CARLOS DE BARILOCHE (ARGENTINA) INSTITUTO DE
PLASTIC DEFORMATION ON ORDERED SOLID SOLUTIONS AND ITS EFFECT IN PHYSICAL PROPERTIES,
Final rept.,
by Aldo E. Vidoz. Sep 65, 26p. Contract DA ARO49 092 63 12 ,DA ARO49 092 64G36 Proj. DA 20014501B32D00 002LA

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Solid solutions, Deformation), (*Nickel alloys, Iron alloys), (*Deformation, Single crystals), Argentina, Tensile properties, Stresses, Creep, Dynamics

Single crystals of Ni3Fe were analyzed, chemically, by optical microscopy and X-ray diffraction: Specimens were annealed in vacuum at 850C and quenched. Tests were then made of tensile

strength. Experimental results of yield stress and resolved shear stress were presented. Deformation curves are plotted for the ordered and disordered alloy. Shear stress vs shear strain is shown graphically. Discussion of results, to include experiments still in progress, cover yield strength and work hardening. Reference is made to investigation of high temperature creep in these alloys. Resistivity measurements were made and are discussed from viewpoints of short time and long time kinetics. (Author)

AD-621 132 **See Fld. 9/1**

AD-621 220 **See Fld. 20/12**

AD-621 261 **See Fld. 20/12**

AD-621 313 **See Fld. 20/2**

AD-621 382 Div. 17/2 ,4/2
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
SOME METALLURGICAL APPLICATIONS OF FLAME SPECTROPHOTOMETRY,
by C. A. Waggoner. 1964, 9p. Rept. no. reprint 65-4

Unclassified report

Pub. in Canadian Spectroscopy v10 n3 May 1965 (Copies available only to DDC users).

Descriptors: (*Alloys, Quantitative analysis), (*Spectrum analysers, Alloys), Canada, Stainless steel, Copper alloys, Nickel alloys, Chemical analysis, Spectra (Visible + ultraviolet), Spectroscopy

The flame spectrophotometric method has been used advantageously for several years to analyse metal alloys. Typical of the applications are the determinations of principal alloying constituents in stainless steels and copper-nickel alloys. Elements determined in the respective alloy classes are chromium, nickel, and manganese; and nickel, iron, and manganese. Studies of the oxy-hydrogen flame emission spectra of these alloys show that interference effects are not of sufficient magnitude to necessitate preliminary separations. Rapid and accurate alloy identification is possible with very small samples (<100 mg), which makes the method suitable for essentially non-destructive analysis. (Author)

AD-621 383 Div. 17/2 ,26/8
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
STRESS-CORROSION CRACKING OF MARTENSITIC STAINLESS STEEL COMPONENTS OF MAIN BOILER SAFETY VALVES,
by B. F. Peters, and C. F. Hase. 1964, 8p. Rept. no. reprint 65-1

Unclassified report

Pub. in J. R. N. S. S. v20 p1-7 1 Jan 1965 (Copies available only to DDC users).

Descriptors: (*Safety valves, Fracture (Mechanics)), (*Corrosion, Stainless steel), (*Fracture (Mechanics), Stainless steel), (*Stainless steel, Corrosion), Martensite, Canada, Stresses, Failure (Mechanics), Boilers

Metallurgical examinations have been made on a number of failed components of the safety valves of Babcock and Wilcox Y100 type marine boilers. In each case, the failed parts were fabricated from a martensitic stainless steel, and the failure mechanism was stress corrosion cracking. The substitution of a material less susceptible to this type of failure has been suggested. In the interim, nondestructive examinations are being conducted on existing martensitic stainless steel valve parts, and these examinations have confirmed that additional components were in the process of failing by stress corrosion cracking. (Author)

AD-621 409 **See Fld. 20/2**

AD-621 439 **See Fld. 1/3**

AD-621 491 Div. 17/2 ,30/5
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
RADIOGRAPHY FOR CORROSION EVALUATION,
by B. F. Peters. 1965, 8p. Rept. no. reprint-65-2

Unclassified report

Presented at the B.C. Metals Conference, Jun 5 1964. Pub. in Materials Evaluation Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Radiography, Corrosion), (*Corrosion, Radiography), Canada, Nondestructive testing, Fracture (Mechanics), Stresses, Fatigue (Mechanics)

Radiography is shown to be a useful corrosion trouble-shooting tool, both in establishing the nature of corrosion problems and also in evaluating the extent of corrosive damage. Examples of corrosion problems caused by the following mechanisms and examined by radiography are illustrated: (a) pitting, (b) general wastage, (c) corrosion-fatigue cracking, (d) intergranular and stress corrosion cracking. (Author)

AD-621 492 Div. 17/2 ,31/5
PACIFIC NAVAL LAB ESQUIMALT (BRITISH COLUMBIA)
STRESS CORROSION CRACKING IN MARINE SERVICE,
by B. F. Peters, J. A. H. Carson, and R. D. Barer. 1965, 11p. Rept. no. reprint-65-6

Unclassified report

Pub. in Materials Protection v4 n5 p24-37 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Corrosion, Marine engineering), (*Fracture (Mechanics), Corrosion), Canada, Stresses, Brass, Zinc alloys, Aluminum alloys, Bronze, Magnesium alloys, Copper alloys, Steel, Stainless steel, Naval equipment, Corrosive liquids, Microstructure

The report explains what stress corrosion cracking is, factors necessary, and how it can be recognized. Gives several examples of stress corrosion cracking occurring on several engineering metals used in naval service: high (35% or more) zinc brasses in sea water and atmosphere; high (12%) aluminum bronze in sea water; aluminum silicon bronze in steam condensate; high magnesium (10%) and copper (4%) aluminum alloys in sea water and atmosphere; mild steel in caustic boiler water; austenitic stainless steel in hot, high chloride environments; and martensitic stainless steel in both chloride and condensate type hot environments. Shows how bird droppings and other excreta can be source of ammonia required for stress corrosion cracking of copper base alloys. Equipment failures discussed include tubing, bolts, screws, propellers, valves, hand rail stanchion,pump arts, clamps, pipe coupling, and gaskets. (Author)

AD-621 502 Div. 17/7 ,25/8
OHIO STATE UNIV COLUMBUS
THE RELATIVE THERMODYNAMIC PROPERTIES OF SOLID NICKEL-PALLADIUM ALLOYS.
Revised ed.,
by L. R. Bidwell, and R. Speiser. 22 Jun 64, 12p.

ARL , 65-132

Unclassified report

Pub. in Acta Metallurgica, v13 p61-70 Feb 1965. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 4 May 64.

Descriptors: (*Nickel alloys, Palladium alloys), (*Thermodynamics, Nickel alloys), Solid solutions, Specific heat, Entropy, Enthalpy, Ferromagnetic materials, Transformations

The relative thermodynamic properties of solid nickelpalladium alloys were determined in the temperature range 700-1200C using a galvanic cell with a solid electrolyte. Within experimental error, the relative partial molar free energies of nickel were linear functions of the temperature, signifying that delta C sub p above 700C is essentially zero and that the specific heats at elevated temperatures can be approximated by the KoppNeumann rule. Nickel-rich solutions were found to exhibit endothermic enthalpies of mixing and positive deviations from Raoult's law for the activity of the solvent and negative deviations for the activity of the solute. Palladium-rich solutions, on the other hand, exhibit exothermic enthalpies of mixing and negative deviations from Raoult's law for the activity of the solvent and solute alike. The excess entropies of mixing are positive for all compositions. This is considered to be primarily a result of the ferromagnetic properties of the alloys. From a consideration of magnetic, electronic, vibrational, and lattice distortional factors it has been concluded that nickel-palladium alloys, particularly those rich in palladium, exhibit significant short-range order. (Author)

AD-621 567 Div. 17/2 ,17/4 ,17/5 ,17/6 ,+
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON DC
METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURAL MATERIALS.
Quarterly progress rept. no. 7,
by R. J. Goode, K. B. Lloyd, D. G. Howe, R. W. Huber, and P. P. Puzak. May 65, 82p. Rept. no. NRL-6327
Proj. SP00405 ,SF020 01 01 0724

Unclassified report

See also AD-612 620.

Descriptors: (*Submarine hulls, Metal plates), (*Titanium alloys, Fracture (Mechanics)), (*Aluminum alloys, Fracture (Mechanics)), (*Steel, Fracture (Mechanics)), (*Fracture (Mechanics), Ship plates), (*Toughness, Ship plates), Titanium, Aluminum, Maraging steels, Nickel alloys, Chromium alloys, Molybdenum alloys, Vanadium alloys, Fatigue (Mechanics), Corrosion, Heat treatment, Welds, Deformation, Tests

A progress report covering research studies in high strength structural materials is presented. Fracture toughness index diagrams are presented for titanium and aluminum that define the expected yield strength region of high fracture toughness, requiring plastic overloads for fracture propagation, and low fracture toughness, requiring elastic stresses for fracture propagation, and linear elastic fracture mechanics techniques for determining elastic stress level required for fracture. Results on heat treatment and alloy development studies are reported for several titanium alloys and drop-weight tear test results on some commercially produced aluminum alloys are described. Results of plane strain fracture toughness tests on unalloyed titanium using single-edge-notched and side-notched specimens are reported. Explosion bulge tests on a series of 5Ni-Cr-Mo-V and maraging steel weldments are described in which the results appear encouraging. Low cycle fatigue crack propagation studies on D6AC and 4335 high strength steels are described in which an acceleration of fatigue crack growth rate was seen for each steel in a salt water environment. The 4335 steel test results indicated a stress corrosion cracking condition operating in addition to the action of fatigue cracking. (Author)

AD-621 600 **See Fld. 8/9**

AD-621 601 **See Fld. 20/2**

AD-621 603 Div. 17/7 ,25/8
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
COMMENT ON PRECIPITATION IN GOLD-PLATINUM ALLOYS: THERMODYNAMICS,
by D. de Fontaine, and J. E. Hilliard. 15 Feb 65, 3p. Contract DA31 124ARO D233 Proj. 20010501B700
AROD , 4975:1

Unclassified report

Pub. in Acta Metallurgica v13 n9 p1019-20 1965 (Copies available only to DDC users).

Descriptors: (*Gold alloys, Platinum alloys), (*Thermodynamics, Gold alloys), Phase studies, Errors, Curve fitting, Mathematical analysis

The purpose of the present note is to point out a computational error in a paper on the thermodynamics of the gold-platinum system by van der Toorn and Tiedema. It is also shown that the method used by these authors for calculating the free-energy curve from the phase diagram is, in any case, unreliable because of its extreme sensitivity to small shifts in the position of the phase boundaries.

AD-621 606 **See Fld. 20/12**

AD-621 615 Div. 17/7 ,25/6 ,25/8
UPPSALA UNIV (SWEDEN) DEPT OF PHYSICS
LOW FIELD GALVANOMAGNETIC EFFECTS OF BI-SB ALLOYS AT 4.2K,
by B. Ronnlund, L. Ericsson, and O. Beckman. 8 Apr 65, 12p. Contract AF EOAR53 63 Proj. 9763 Task 976302
AFOSR , 65-1175

Unclassified report

Pub. in Arkiv for Fysik, v29 n16 p237-44 Jan 13 1965. (Copies available only to DDC users).

Descriptors: (*Bismuth alloys, Antimony alloys), Electrons, Ellipsoids, Band spectrum, Single crystals, Electric fields, Magnetic fields, Chemical analysis, Relaxation time, Cryogenics, Sweden

Galvanomagnetic measurements at 4K are reported on bismuth-antimony alloys containing 5 and 12 at-% antimony. The mobility tensor indicates electron ellipsoids of the same shape as in bismuth. A pronounced change in the parameters of the hole ellipsoids of revolution might be caused by the influence of an extra, high mobility valence band. (Author)

AD-621 616 Div. 17/2
ILLINOIS UNIV URBANA
NOTES ON THE MN-SI PHASE DIAGRAM,
by D. I. Bardos, and Paul A. Beck. 22 Mar 65, 2p.
AROD , 5103:1

Unclassified report

Pub. in Transactions of the Metallurgical Society of AIME, v233 p1446-7 Jul 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Manganese alloys, Silicon alloys), (*Phase studies, Manganese alloys), Transition temperature, Crystal structure, X-ray diffraction analysis, Metallography, Metalloid alloys

11/7. MISCELLANEOUS MATERIALS

AD-620 878 **See Fld. 7/3**

AD-620 930 Div. 14/6
CFSTI Prices: HC $2.00 MF $0.50
CALIFORNIA UNIV BERKELEY
DYNAMIC BEHAVIOR OF CONCRETE.
Rept. for 4 Mar 64-15 Sep 65,
by WernerGoldsmith. Oct 65, 47p. Contract N60530 9806 Proj. LP849 ,LP556
NOTS ,NAVWEPS TP-3890, ,8790

Unclassified report

Descriptors: (*Concrete, Dynamics), Cements, Loading (Mechanics), Statics, Compressive properties, Elasticity, Shock resistance, Propagation, Aging (Materials), Tensile properties

Concrete and cement paste specimens, representing a model of the actual structural material and of its adhesive component, respectively, were subjected to static and dynamic tests. Static tests on virgin specimens were carried out in order to evaluate the strength, elasticity and Poisson's ratio of the materials. The dynamic experiments were conducted in order to ascertain the response of the specimens to the propagation of one-dimensional pulse. Transient loading was accomplished by the central longitudinal impact of a 1/2-in diameter steel sphere on a ballisticallysuspended 3/4-in diameter Hopkinson bar of the material at an initial velocity of about 3260 in/sec or 1650 in/sec. The shocked specimens were also subsequently examined to determine whether changes in static material properties had occurred as a result of passage of the waves. Both static and dynamic tests yielded consistent results for a number of specimens cast and cured in identical fashion. Comparison of the properties of the virgin and the shocked specimens indicated little, if any shock damage. While some minor grain damage was observed in microscopic examination of thin sections taken from some of the shocked specimens, other sections did not indicate any visible cracking of the grains. The wave propagation process appeared to occur without dispersion and relatively little attenuation, indicating that the material could be represented on a macroscopic scale as an 'elastic' substance with a small structural damping coefficient. The obvious inhomogenieties of the concrete affected the gage response whenever a gage was mounted directly over a piece of aggregate. (Author)

AD-620 955 Div. 14/6 ,13/4
CFSTI Prices: HC $2.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO CHEMICAL ENGINEERING BRANCH
LABORATORY STUDIES OF ASPHALTIC CONCRETES CONTAINING ASBESTOS FIBERS, RUBBERIZED ASPHALT AND EPOXY-RESIN ASPHALT,
by M. E. Hickey. 9 Jul 65, 48p. Rept. no. ChE-48

Unclassified report

Descriptors: (*Concrete, Additives), (*Asphalt, Additives), Asbestos, Synthetic rubber, Styrene plastics, Epoxy plastics, Mechanical properties, Cements, Pavements, Erosion, Wear resistance

A study on uses of additives for improving asphaltic concrete for hydraulic construction showed that fine asbestos fibers (waste screenings) can be used advantageously. The increased compressive and tensile strength, stability, and erosion resistance properties gained with the fibers should provide a highly durable material capable of withstanding the major stresses that develop during service. Of the two rubberized asphalts tested, GRS and neoprene, it was indicated that the neoprene asphalt produced the better asphaltic concrete, particularly on the basis of stability and erosion resistance. Compared to the control, asbestos fibers, and rubberized asphalt mixes, the epoxy-asphalt concrete excelled in all physical properties determinations with the exception that flexibility was less than the rubberized asphalt mixes, and erosion resistance was comparable to the asbestos fiber mixes. The epoxy-asphalt concrete appears to be a very strong and tough material for hydraulic construction application; however, more data are required relative to its long-term weatherability. The relatively high cost of epoxy-asphalt approximately five times that of normal hot-mix, would restrict its use to special applications.

AD-620 998 **See Fld. 13/8**

AD-621 032 **See Fld. 11/9**

AD-621 063 **See Fld. 20/12**

AD-621 070 **See Fld. 20/4**

AD-621 136 **See Fld. 9/1**

AD-621 522 Div. 14/6 ,3/1
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA UNIV RESEARCH INST NORMAN
STRENGTH PROPERTIES AND RELATIONSHIPS ASSOCIATED WITH VARIOUS TYPES OF FIBERGLASSREINFORCED FACING SANDWICH STRUCTURE.
Final rept. for 5 Apr 62-31 Jul 64,
by Gene M. Nordby, and W. C. Crisman. Aug 65, 87p. Contract DA44 177AMC893T Proj. 1P125901A14203
USAASVLABS , TR-65-15

Unclassified report

Descriptors: (*Sandwich panels, Airplane panels), (*Laminated plastics, Sandwich panels), (*Glass textiles, Reinforcing materials), Failure (Mechanics), Loading (Mechanics), Honeycomb cores, Impregnation, Aging (Materials), Deformation, Composite materials, Surface properties, Plastics, Epoxy plastics

Contributions to the acceptance of fiberglass-reinforced plastic (FRP) as an aircraft structural material were made through verification of existing theoretical strength relationships by the fabrication and testing of sandwich panels in the laboratory. The four basic failure modes were investigated for sandwich plates and plate columns loaded in edgewise compression. These were general buckling, face wrinkling, shear crimping and face dimpling. To achieve these modes, it was necessary to vary not only the specimen size and boundary conditions but also, in many cases, the dimensions and composition of the constituent materials. In the development of a suitable structural sandwich, a number of advances were made in the realm of fabrication. These include the development of a multi-ply pre-preg, the establishment of a precure phase in the resin cure cycle as a control of resin flow, and the use of the separately-bonded type of sandwich construction. The effect of adhesive filleting on the core strength and the effect of laminate thickness on facing strength properties were also isolated. (Author)

AD-621 547 **See Fld. 11/9**

AD-621 552 Div. 14/6 ,1/3 ,14/10
CFSTI Prices: HC $1.00 MF $0.50
FOREST PRODUCTS LAB MADISON WIS
EFFECT OF CORE THICKNESS AND MOISTURE CONTENT ON MECHANICAL PROPERTIES OF TWORESIN-TREATED PAPER HONEYCOMB CORES.
Research paper,
by Paul M. Jenkinson. Sep 65, 25p. Rept. no. RP-FPL-35
Contract AF33 615 65 5002

Unclassified report

This Report is One of a Series Issued in Cooperation with the MIL-HDBK-23 Working Group on Composite Construction for Flight Vehicles of the Depts.

Descriptors: (*Honeycomb cores, Mechanical properties), (*Paper, Honeycomb cores), Compressive properties, Shear stresses, Sandwich panels, Thickness, Moisture, Plastic coatings, Elasticity, Loading (Mechanics), Aircraft panels

This report presents the results of compression and shear evaluations of two resin-treated paper honeycomb cores. The cores had densities of 1.7 and 3.7 pounds per cubic foot. Cores were evaluated in thicknesses of 1/4 to 2 inches and at several moisture contents ranging up to 80 percent. Compressive strength of 1/4-inchthick cores was 25 to 80 percent greater than that of 2inch-thick cores. Compressive strength and modulus of elasticity of cores at 10 percent moisture content were 50 to 70 percent of those at 4 percent moisture content. Cores soaked in water (60 to 80 percent moisture content) had only 20 to 30 percent of the strength and modulus of elasticity of those at 4 percent moisture content. Core shear strength was two to four times as high for 1/4-inch as for 2-inch-thick cores. Core shear strength and modulus of rigidity at 10 percent moisture content was 50 to 70 percent of that at 4 percent moisture content; cores soaked in water had 20 to 40 percent of the strength and modulus of rigidity of those at 4 percent moisture content. Specimens sheared parallel to the core ribbon direction had about twice the strength and three times the stiffness as those of the same core sheared perpendicular to the core ribbon direction. (Author)

AD-621 553 See Fld. 20/12

AD-621 576 See Fld. 11/9

11/8. OILS, LUBRICANTS, AND HYDRAULIC FLUIDS

AD-621 008 Div. 14/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
POLYSILOXANES AS ANTIFRICTION AND ANTIWEAR ADMIXTURES TO PETROLEUM GREASES,
by G. V. Vinogradov, N. S. Nametkin, and M. I. Nosov. 18 Jun 65, 13p. Rept. no. FTD-TT-65-316
TT , 65-63933

Unclassified report

Unedited rough draft trans. of Neftekhimiya (USSR) v3 n5 p792-8 1963.

Descriptors: (*Greases, Lubricant additives), (*Lubricant additives, Siloxanes), (*Siloxanes, Lubricant additives), Ware resistance, Lubricants, Testing, USSR

AD-621 072 See Fld. 14/2

AD-621 566 Div. 14/5 ,4/3 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
NMR ANALYSIS OF MIXED PENTAERYTHRITOL DIPENTAERYTHRITOL, AND 1, 1, 1-TRIMETHYLOPROPANE ESTERS.
Final rept.,
by W. B. Moniz, and C. F. Poranski,Jr.. 19 Aug 65, 23p. Rept. no. NRL-6307
Proj. RR001 01 43 4806 Task RAP41R001 6521F012 03 05

Unclassified report

Descriptors: (*Airplane engine oils, Nuclear magnetic resonance), (*Esters, Nuclear magnetic resonance), (*Lubricants, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Lubricants), Non-destructive testing, Test methods, Spectrum analyzers, Calibration, Molecular properties, Organic solvents

Benzene solutions of mixed pentaerythritol, dipentaerythritol, and 1, 1, 1-trimethylolpropane esters may be quantitatively assayed by proton NMR spectroscopy with an absolute accuracy of =5 mole-% for each of the ester types. Higher accuracies are possible if a calibration curve is used. Average acid chain length and the approximate degree of chain branching are also obtained. The NMR method can be used for monitoring base stocks, checking blend compositions, and determining constancey of formulation of oils qualified under specification MIL-L23699. NMR analyses of a group of commercial esters and of several aircraft engine lubricant formulations were made. Results were obtained on both the Varian A-60 and HA-100 spectrometers, with comparable accuracy. The A-60 is felt to be the preferred instrument, however, because its integrals are simpler to process. (Author)

11/9. PLASTICS

AD-620 887 Div. 14/8
CFSTI Prices: HC $4.00 MF $0.75
MELLON INST PITTSBURGH PA
POLYMER STRUCTURES AND PROPERTIES.
Rept. for 1 Feb 60-30 Apr 61,
by E. F. Casassa, T. A. Orofino, J. W. Mickey, T. G. Fox, and G. C. Berry. 30 Apr 61, 110p.
Contract AF33 616 6968 Proj. 0 7 7340
ASD , TR-61-22

Unclassified report

Descriptors: (*Polymers, Molecular structure), (*Styrene plastics, Molecular structure), (*Vinyl plastics, Molecular weight), (*Polyethylene plastics, Molecular properties), Solutions, Optical properties, Scattering, Interference, Organic solvents, Photometers, Polymerization, Proteins, Stresses, Strain (Mechanics), Elasticity, Viscosity

Investigations relating to dilute solutions of polymers comprised: a theoretical treatment of Rayleigh scattering to include both intramolecular and intermolecular optical interference effects; the temperature dependence of the second virial coefficient for polystyrene in cyclohexane; the intrinsic viscosity-molecular weight relation for poly- (vinyl acetate) in butanone; and design and construction of a precision light scattering photometer. The melt viscosity-molecular weight relation at 218C for monodisperse polystyrene prepared anionically was found to be identical with that for ordinary fractions. Poly- (vinyl acetate), prepared by an emulsion polymerization in the presence of a protein, yielded an insoluble component containing bound protein. Preliminary stress-strain measurements on cross-linked swollen polyethylene gave only equivocal evidence for specific solvent effects on the unperturbed randomflight dimensions of the polymer chains. (Author)

AD-620 972 Div. 14/8 ,4/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HIGH MOLECULAR COMPOUNDS (SELECTED ARTICLES),
11 Jun 65, 15p. Rept. no. FTD-TT-65-301
TT , 65-63913

Unclassified report

Unedited rough draft trans. of Vysokomolekulyarnye Soedineniya (USSR) v6 n4 p691-4, 734-6 1964.

Descriptors: (*Silanes, Polymers), (*Organic nitrogen compounds, Polymers), Polymerization, Catalysts, Mechanical properties, Ammonium compounds, Carbonates, Chemical bonds, USSR

Contents: Catalytic polymerization of trimethyltriphenylcyclo trisilazane, by K. A. Andrianov and G. V. Kotrelev; Polymers with conjugated bonds from ammonium carbonate and ammonium bicarbonate, by Ya. M. Paushkin, A. F. Lunin and O. Yu. Omarov.

AD-620 999 See Fld. 7/3

AD-621 003 See Fld. 13/9

AD-621 032 Div. 14/8 ,4/3 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
PHOSPHONITRILIC POLYMERS STABLE AT HIGH TEMPERATURES.
Quarterly rept. no. 3, 1 May-31 Jul 65,
by Douglas I. Relyea, Gerald J. Klender, and Aspet Merijanian. 29 Aug 65, 19p. Contract NObs92060 Proj. SR007 03 03 Task 1000

Unclassified report

See also AD-616 761.

Descriptors: (*Heat-resistant plastics, Preparation), (*Phosphonitrile chlorides, Polymerization), (*Thermal insulation, Heat-resistant plastics), Organoboranes, Molecular isomerism, Condensation reactions, Aromatic compounds, Glycols, Thermochemistry

The objective of the program is the development of new thermoplastic and thermosetting resins from phosphonitrilic chloride trimer for high-temperature insulation. Reactions of bismethylol-o-carborane or its disodium salt with P3N3 (OC6H5)4Cl2 (I) gave low-molecular weight polymers. o-Carborane was thermally isomerized to m-carborane for use in polymerizations with phosphonitrilic monomers. The preparation of I was carried out on a large scale to give monomer for preparation of P-O-P-linked polymer. Monomer I was reacted with several aromatic diols and the resulting polymers examined by thermogravimetric analysis. (Author)

AD-621 057 See Fld. 11/5

AD-621 194 Div. 14/8 ,25/6
WISCONSIN UNIV MADISON
MECHANICAL PROPERTIES OF POLYMER NETWORKS,
by John D. Ferry. 1964, 13p.
AROD , 4129:3

Unclassified report

Pub. in Physics of Non-Crystalline Solids. Proceedings of the International Conference, Delft, Jul 1964 (Copies available only to DDC users).

Descriptors: (*Polymers, Mechanical properties), Elasticity, Transformations, Molecular structure, Deformation, Rubber, Glass, Phase studies, Frequency

The equilibrium elastic properties of polymer networks (stated always with the reservation that true elastic equilibrium is difficult if not impossible to achieve experimentally) are influenced by network defects, notably free strand ends and certain entanglements which appear to be closely related to the coupling entanglements present in uncross-linked polymers of high molecular weight. The time-dependent mechanical properties in small deformations also reflect these defects, and the entanglements may be the primary source of the mechanical losses in rubbery networks which persist to far lower frequencies than could be expected from the motions of individual network strands. At higher frequencies, in the transition between rubber-like and glass-like behavior, the presence of a network affects mechanical properties to a comparatively slight degree, but the presence of the cross-links causes a perceptible decrease in the short-range mobility of the polymer chains. (Author)

AD-621 228 Div. 14/8 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF CHEMISTRY
THE ADSORPTION OF POLYMERS ON SOLIDS FROM SOLUTIONS.
Final rept.,
by Fred Rowland. Aug 62, 12p. Contract AF49 638 331
AFOSR , 3784

Unclassified report

Descriptors: (*Polymers, Adsorption), (*Acrylic resins, Adsorption), (*Vinyl plastics, Adsorption), (*Styrene plastics, Adsorption), Organic solvents, Aromatic compounds, Ketones, Cyclohexanes, Films, Thickness, Density, Diffusion

Results are given of measurements of the thickness of adsorbed polymer films of the densities of the polymer in such films. Polymer-solvent systems used were: polymethyl methacrylate in benzene; polyvinyl acetate in benzene and in methyl ethyl ketone; and polystyrene in benzene, cylohexane, and mixtures of the two. Film thicknesses were found to vary directly with solvent power. Film densities of the polar polymers were found to be directly proportional to coil density. The film density of the high molecular weight fractions of polystyrene was independent of coil density and also had a temperature dependence, at all M.W. fractions, not exhibited by the other polymers.

AD-621 237 **See Fld. 7/3**

AD-621 305 Div. 14/8 ,4/3
STANFORD UNIV CALIF DEPT OF CHEMISTRY
THE CONFIGURATION OF VINYL POLYMERS. EXPERIMENTAL RESULTS,
by J. E. Mark, and P. J. Flory. 26 Oct 64, 8p.
Contract AF49 638 1341
AFOSR , 65-1215

Unclassified report

Pub. in Journal of the American Chemical Society v87 n7 p1423-8 Apr 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Vinyl plastics, Molecular structure), Molecular properties, Stereochemistry, Viscosity, Thermal properties, Stresses, Osmotic pressure, Chemical precipitation

The characteristic ratio <r sq>0/nxl sq for isotactic poly (n-pentene-1) deduced from intrinsic viscosities of fractions in 2-pentanol at the theta-point (62.4C) is 9.2 = 0.5. This result, though larger than the characteristic ratios for polyethylene, polyisobutylene, and poly (dimethylsiloxane), is less than would be expected on the basis of steric interactions within the isotactic chain structure. The temperature coefficients determined for several isotactic and atactic vinyl polymers from stress-temperature measurements on cross-linked networks in the amorphous state, are found to be positive but small with values as follows: isotactic poly (butene-1), 0.09; isotactic poly (n-pentene-1), 0.34; atactic poly (butene-1), 0.50; atactic poly (n-pentene-1), 0.53; and atactic poly (isopropyl acrylate), 0.25. The temperature coefficient for isotactic poly (n-pentene-1) deduced from the temperature dependence of its intrinsic viscosity in n-hexadecane is in satisfactory agreement with the stress-temperature value. The significance of these results is discussed in relation to those for other vinyl polymers and also with reference to predictions from analysis of the chain structure and the interactions of its substituents. (Author)

AD-621 306 Div. 14/8 ,4/4
STANFORD UNIV CALIF DEPT OF CHEMISTRY
THE CONFIGURATION OF THE POLYOXYETHYLENE CHAIN,
by J. E. Mark, and P. J. Flory. 26 Oct 64, 12p.
Contract AF49 638 1341 Proj. 9760 Task 976003
AFOSR , 65-1214

Unclassified report

Pub. in Journal of the American Chemical Society v87 n7 p1415-22 Apr 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Glycols, Polymers), (*Polymers, Molecular structure), Molecular properties, Stereochemistry, Thermal properties, Stresses, Viscosity, Molecular weight, Force (Mechanics), Chemical bonds, Plasticizers

Experimental stress-temperature coefficients for polyoxyethylene networks are presented from which the coefficient d ln <r sq>0/dT is deduced. An estimate is given of the characteristic ratio <r sq>0/nl sq based on the intrinsic viscosity-molecular weight studies of Bailey and co-workers. A theoretical treatment of the polyoxyethylene chain is also given in terms of the rotational isomeric state scheme successfully applied to other polymers. (Author)

AD-621 547 Div. 14/8 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
PREVENTION OF DETERIORATION CENTER NAS-NRC WASHINGTON D C
REINFORCED PLASTICS AND LAMINATES FOR HOT STRUCTURES (600 F AND ABOVE),
by William A. Cosby, and Hans Janecka. Feb 64, 18p. Rept. no. pdc search No. 64-009 ,PDL-50534

Unclassified report

Descriptors: (*Bibliographies, Heat-resistant plastics), (*Heat-resistant plastics, Bibliographies), (*Structures, Heat-resistant plastics), Laminated plastics, Structural parts, Fibers, Mechanical properties, Thermal properties, Abstracting, Adhesives, Composite materials, Glass textiles

A bibliography on heat and oxidation resistant reinforced plastics and laminates for long-time structural use at temperatures of 600 F and above consisting primarily of references which evaluate such material systems from a mechanical properties point of view. References which evaluate the electrical properties of the material systems selected for their structural applicability are included if the evaluations were made at temperatures greater than 600 F. Selected documents on reinforcement fibers are included due to interest in finishes and processing conditions which aid in the retention of fiber strengths at high temperatures. The bibliography does not contain references which evaluate the ablative characteristics of the materials.

AD-621 557 Div. 14/8 ,26/1 ,26/2 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
GENERAL ELECTRIC CO HUNTSVILLE ALA COMPUTER DEPT
PRODUCTION ENGINEERING MEASURE POLYCARBONATE PLASTIC FILM.
Quarterly rept. no. 1, 1 Jun-18 Aug 65,
by Lawrence S. Lazar. 15 Sep 65, 25p. Contract DA36 039AMC06165E

Unclassified report

Descriptors: (*Polyester plastics, Dielectric films), (*Dielectric films, Polyester plastics), Manufacturing methods, Dielectric properties, Extrusion, Thickness, Tensile properties, Finishes + finishing, Surface properties, Films

The report contains the progress during the first quarter polycarbonate plastic film program. The objective of establishing a base-line in producing polycarbonate film in the thicknesses and at the rates required by the contract were met. In addition, work on optimizing the texturing work was done. (Author)

AD-621 576 Div. 14/8 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
FOREST PRODUCTS LAB MADISON WIS
EFFECT OF THERMAL CYCLING ON TENSILE AND COMPRESSIVE STRENGTH OF REINFORCED PLASTIC LAMINATES.
Research paper,
by Gordon H. Stevens. Aug 65, 11p. Rept. no. RP-FPL-37
Contract AF33 657 63 358

Unclassified report

This Report is One of a Series Issued in Cooperation with the MIL-HDBK-17 Working Group on Plastics for Flight Vehicles of the Depts. of the Air Force, Navy, and Commerce.

Descriptors: (*Laminated plastics, Thermal properties), Tensile properties, Compressive properties, Elasticity, Phenolic plastics, Epoxy plastics, Silicone plastics, Asbestos, Composite materials, Laminates, Reinforcing materials, Glass textiles, Thermal stresses

The paper presents the modulus of elasticity and strength values of four reinforced plastic laminates in tension and compression at room temperature and at 500F. Prior to evaluation at these temperatures, the test specimens were exposed to thermal-shock cycling. Three of the laminates evaluated in this study were reinforced with 181-A1100 glass fabric and represented three resin systems: a phenolic resin (CTL 37-9X), an epoxy resin (ERSB-0111), and a phenyl-silane (Narmco 534). The fourth was a phenolic-asbestos laminate made of R/M Pyrotex felt style 41-RPD. The effects of thermalshock cycling on properties vary with the type of resin and reinforcement. In general, thermal-shock cycling had less effect on modulus of elasticity than on strength. Properties at room temperature tended to decrease after exposure to cycling, while the properties of most laminates evaluated at 500F. were not seriously affected. (Author)

11/10. RUBBERS

AD-621 545 Div. 14/9
CFSTI Prices: HC $2.00 MF $0.50
PREVENTION OF DETERIORATION CENTER NAS-NRC WASHINGTON D C
ELASTOMERS FOR HIGH TEMPERATURE APPLICATIONS,
by William A. Cosby, and Hans Janecka. Dec 63, 37p. Rept. no. pdc search no. 63-057 ,PDL-50174

Unclassified report

Descriptors: (*Elastomers, Heat-resistant materials), (*Bibliographies, Elastomers), Vulcanizates, Synthetic rubber, Aging (Materials), Degradation, Tires, Rubbers, Silicone plastics, Abstracting, Radiation damage, Space environmental conditions, Physical properties

A bibliography giving pertinent references on 'Elastomer reinforcement-particulate. Strength to 500 F of elastomeric vulcanizates for seals, sealants, tires, etc'. In general, the references are concerned with the response of elastomers - with and without reinforcements-at temperatures to approximately 500 F. However, selected references are included on the response of the same materials in combined environments of high temperature and low pressure (vacuum) or corpuscular radiation. References are also included which depict the response of several elastomers at temperatures well above 500 F.

11/12. WOOD AND PAPER PRODUCTS

AD-621 552 **See Fld. 11/7**

12/1. MATHEMATICS AND STATISTICS

AD-620 831 **See Fld. 20/3**

AD-620 834 **See Fld. 22**

AD-620 839 **See Fld. 5/9**

AD-620 881 **See Fld. 9/4**

AD-620 905 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
REMARKS ON HIGHER ORDER SPECTRA,
by M. Rosenblatt. 1964, 12p.

Unclassified report

Research supported in part by ONR.

Descriptors: (*Stochastic processes, Integral transforms), Measure theory, Time, Taylor's series, Statistical functions

AD-620 908 Div. 15/2
CFSTI Prices: HC $5.00 MF $1.00
AEROSPACE RESEARCH LABS OFFICE OF AEROSPACE RESEARCH WRIGHT-PATTERSON AFB OHIO
TABLES FOR THE DISTRIBUTION OF THE MAXIMUM OF CORRELATED CHI-SQUARE VARIATES WITH ONE DEGREE OF FREEDOM,
by P. R. Krishnaiah, and John V. Armitage. Jul 65, 170p. Rept. no. ARL-65-136
Proj. 7071 Task 707101
Unclassified report

Descriptors: (*Tables, Statistical tests), (*Integrals, Probability), (*Statistical distributions, Tables), Statistical functions

The distribution of the maximum of correlated chi-square variates with one degree of freedom plays an important role in the simultaneous test procedures and ranking and selection procedures. In this paper, extensive tables are given of the probability integrals of this distribution along with certain percentage points for the equicorrelated case. The use of these tables in applying a simultaneous test procedure is also discussed.

AD-620 921 **See Fld. 5/3**

AD-620 982 **See Fld. 20/12**

AD-620 987 Div. 15/2 ,1/3
CFSTI Prices: HC $2.00 MF $0.50
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
GAUSSIAN APPROXIMATIONS TO THE DISTRIBUTION OF SAMPLE COHERENCE.
Final technical rept. for Mar 64-Jan 65,
by Loren D. Enochson, and N. R. Goodman. Jun 65, 35p. Rept. no. MAC-403-07
Contract AF33 615 1418 Proj. 1370 Task 137005
FDL , TR-65-57
Unclassified report

Descriptors: (*Stochastic processes, Integral transforms), (*Numerical analysis, Statistical distributions), (*Integral transforms, Stochastic processes), Sampling, Analysis of variance, Programming (Computers)

This report describes the results of an empirical study to develop a normalizing transformation for sample multiple coherence. The 'Fisher z-transformation' is employed. The expected value (including a bias term) and variance of the transformation have been experimentally determined. Numerical values of the transformation which is developed (including the bias term and variance) may be obtained with a reasonable amount of computation. Tables of the Gaussian distribution can then be used to obtain confidence limits and perform statistical tests. The computational methods and the digital computer program used for the study are described in detail. Flow charts of the program are given. Numerical results from the program results are presented. Examples of the use of the transformation are given for developing confidence limits for multiple coherence. A recommendation for a further theoretical study is presented. (Author)

AD-621 013 **See Fld. 20/3**

AD-621 025 Div. 15/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
THE APPLICATION OF DYNAMIC PROGRAMMING TO A STOCHASTIC CONTROL PROBLEM.
Master's thesis,
by David E. Greene. Jun 65, 74p. Rept. no. GGC/EE/65-5
Unclassified report

Descriptors: (*Dynamic programming, Control systems), (*Stochastic processes, Control systems), Optimization, Iterative methods, Programming (Computers), Search theory

Dynamic programming is used for optimization of a first-order control system with stochastic inputs. The dynamic programming solutions were compared with known analytical solutions and were found to be accurate, but there were many computational difficulties. The major difficulties encountered were: truncation of the returns which limited the number of stages which could be computed, the large computation time and the critical selection of the incremental parameters. A discussion is made of the optimum control system and the characteristics of the disturbance. IBM 7094 Digital Computer Programs are included in the appendicies. (Author)

AD-621 035 **See Fld. 9/3**

AD-621 058 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INVESTIGATION OF CERTAIN FUNDAMENTAL TYPES OF COMPLEX EQUILIBRIUM STATES IN A THREE DIMENSIONAL SPACE,
by R. M. Mints. 10 Jun 65, 68p. Rept. no. FTD-TT-65-352
TT , 65-6394
Unclassified report

Unedited rough draft trans. of Matematicheskii Sbornik (USSR) v63 (105) n2 p169-214 1964.

Descriptors: (*Differential equations, Algebraic topology), (*Algebraic topology, Differential equations), Functional analysis, Complex variables, Stability, Harmonic analysis, Inequalities, USSR

Certain fundamental types of complex equilibrium states are investigated for a system of three autonomous differential equations with analytic right sides or with right sides having a certain finite number of partial derivatives. The equilibrium state in which the real parts of all roots of the characteristic equation are nonzero is said to be simple; if this is not the case, the equilibrium state is said to be complex. All possible toplogical structures of complex equilibrium states of the type considered for the general case are established. A necessary and sufficient condition for coarseness of an equlibrium state in a three-dimensional space is determined and a criterion is given by which it is possible to distinguish between the resulting types of complex equilibrium states in terms of number and types of coarse equilibrium states for nearby systems.

AD-621 086 **See Fld. 9/2**

AD-621 109 Div. 15/1
NORTHWESTERN UNIV EVANSTON ILL
A SHORT PROOF OF THE JAMES PERIODICITY OF PIK+P (VK+M,M),
by Mark Mahowald. 6 Mar 64, 2p. Contract DA31 124ARO D144
AROD , 4489:2
Unclassified report

Pub. in Proceedings of the American Mathematical Society v16 n3 p512 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Groups (Mathematics), Functional analysis), Algebraic topology, Harmonic analysis

AD-621 116 **See Fld. 20/10**

AD-621 133 Div. 15/1
RIAS INC BALTIMORE MD
STABILITY OF NONLINEAR CONTROL SYSTEMS,
by Solomon Lefschetz. 1965, 162p. Contract AF49 638 1242 ,DA36 034ORD3514Z Proj. 9749 Task 974901
AFOSR , 65-1390
Unclassified report

Available copy from Academic Press, Inc., 111 Fifth Ave., New York, N. Y. Mathematics in Science and Engineering Series v13 1965, $6.50.

Descriptors: (*Control systems, Stability), (*Differential equations, Nonlinear systems), Matrix algebra, Vector analysis, Fourier analysis, Integral transforms

A concise picture of control stability is presented as it has developed from the method of liapunov. Elementary work, dealing only with dimensions one and two, is presented first. The theory in the pre-Popov period is presented, with emphasis placed on vectors and matrices. Popov's contribution is presented along with his extensive use of Fourier transforms and advanced analysis. A theorem weaker than Kalman's completion of Popov's second theorem is presented. It rests upon an important lemma due to Yacubovich and its proof follows that of Kalman.

AD-621 137 **See Fld. 14/2**

AD-621 150 Div. 15/2 ,18/3
CFSTI Prices: HC $2.00 MF $0.50
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
BEST LINEAR UNBIASED ESTIMATORS OF THE PARAMETERS OF THE LOGISTIC DISTRIBUTION USING ORDER STATISTICS.
Mimeograph series,
by S. S. Gupta, A. S. Qureishi, and B. K. Shah. Aug 65, 43p. Rept. no. MS-52
Contract AF33 657 11737
Unclassified report

Descriptors: (*Statistical distributions, Sampling), (*Logistics, Statistical distributions), Analysis of variance, Least squares method, Statistical analysis

Let X sub l, n < or = x sub 2, n < or = . . . < or = x sub n, n be the n order statistics from a logistic distribution with mean m and standard deviation s, respectively. The best linear estimators of the type ξ a sub i, n x sub i, n and ξ b sub i, n x sub i, n where the ξ extends from r sub 1 + 1 to n-r sub 2 and where r sub 1 and r sub 2 are the missing observations in the beginning and at the end (i.e. censored case). Tables of a sub i, n and b sub i, n are given for n=2 (1)25 for selected values of r sub 1 and r sub 2. The variances and covariances of these estimators are also given and relative efficiencies are evaluated. A table of the covariances of these estimators are also given and relative efficiencies are evaluated. A table of the covariances for n=11 (1)25 of all order statistics is also provided. (Author)

AD-621 151 Div. 15/1 ,15/2
CFSTI Prices: HC $2.00 MF $0.50
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
ON THE PROPERTIES OF SUBSET SELECTION PROCEDURES.
Mimeograph series,
by John J. Deely, and Shanti S. Gupta. Aug 65, 27p. Rept. no. MS-49
Contract AF33 657 11737 ,Nonr 110026
Unclassified report

Descriptors: (*Set theory, Population (Mathematics)), (*Decision theory, Set theory), Analysis of variance, Game theory, Sampling

Some desirable properties are studied of a selection procedure which selects the normal population with mean m and variance unity (i=1,2,...,k) if the observed sample mean x sub i from p contained in (x (Max)- d, x (max)). This rule earlier studied by Gupta (1956, 1965) is compared with the 'approximate' optimal rule D of Seal (1955). It is shown that the rule R is minimax. It is also shown that under the slippage configuration of means given by (m,m,...,m+ delta) the expected size of the selected subset using R is smaller than that corresponding to D and that the probability of a correct selection using R is strictly greater than that of D, provided delta satisfies some inequalities. Under a more general linear loss function, the Bayes rule for selecting a subset is also derived. (Author)

AD-621 154 Div. 15/1 ,26/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
ALLOCATION OF VEHICLES AT CENTERS.
Technical note,
by Harry Gonshor, and C. E. Parker. 3 Sep 65, 21p. Rept. no. TN-N-765

Unclassified report

Descriptors: (*Vehicles, Distribution), (*Inventory control, Operations research), Optimization, Possibility, Mathematical models, Programming languages

The technical note develops a model for the problem of allocating vehicles to centers where the total number of vehicles available is fixed. An algorithm for obtaining the optimal allocation is illustrated by means of an example. This model assumes the demand distribution for vehicles is known and that a penalty for lack of a vehicle at each center can be postulated. (Author)

AD-621 176 Div. 15/2
PRINCETON UNIV N J
INVARIANT PRIOR DISTRIBUTIONS.
Revised ed.,
by J. Hartigan. 25 Aug 63, 11p.

Unclassified report

Pub. in the Annals of Mathematical Statistics, v35 n2 p836-45 Jun 1964. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 29 Jan 63. Supported in part by ONR.

Descriptors: (*Distribution theory, Invariance), (*Invariance, Distribution theory), Probability, Statistical distributions, Decision theory

The paper is mainly concerned with determining prior distributions on ignorance over parameter spaces, using invariance techniques similar to those of decision theory. Prior distributions are rarely determined exactly by such techniques and a number of less compelling methods for exact determination are given. (Author)

AD-621 201 Div. 15/1 ,20/5
CFSTI Prices: HC $4.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE
THE NUMERICAL SOLUTION OF BOUNDARY VALUE PROBLEMS.
Doctoral thesis,
by John William Lucey. 14 May 65, 116p. Contract AF AFOSR341 63 Proj. 9749 Task 974901
AFOSR , 65-1279

Unclassified report

Descriptors: (*Boundary value problems, Numerical analysis), (*Neutron transport theory, Boundary value problems), (*Numerical analysis, Neutron transport theory), Nuclear reactors, Thermal neutrons, Diffusion, Thermal utilization, Matrix algebra, Special functions (Mathematical), Vector analysis, Difference equations, Iterative methods

The marchout method is extended to the numerical solution of second order 2-dimensional inhomogeneous problems and the one velocity neutron transport equation. In the method the solution is expanded in a full set of vectors which are used in an unstable difference equation. The error growth is controlled, however, by periodic matrix transformations which insure the completeness of the vector set. The error in the solution is determined by the frequency of these transformations and may be preset. The method has its greatest advantage in relation to the computational speed of conventional methods in elongated meshes, such as multigroup diffusion calculations or low order discrete ordinate or P sub N calculations with many spatial mesh points. (Author)

AD-621 215 Div. 15/1
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
SUMMABILITY METHODS ON MATRIX SPACES,
by Josephine Mitchell. 30 Nov 59, 16p. Contract AF49 638 826
AFOSR , 3038

Unclassified report

Pub. in Canadian Journal of Mathematics v13 p63-77 1961 (Copies available only to DDC users).

Descriptors: (*Matrix algebra, Combinatorial analysis), Complex numbers, Potential theory, Fourier analysis, Series, Integration, Inequalities, Theorems

AD-621 217 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV MINNEAPOLIS DEPT OF MATHEMATICS
CLUSTER SETS OF PSEUDO-MEROMORPHIC FUNCTIONS.
Technical note,
by D. A. Storvick. Jun 61, 16p. Rept. no. TN-1
Contract AF49 638 863
AFOSR , 935

Unclassified report

Descriptors: (*Set theory, Functions), (*Functions, Set theory), Transformations (Mathematics), Conformal mapping, Convex sets, Complex variables, Topology

AD-621 219 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV MINNEAPOLIS DEPT OF MATHEMATICS
QUASI-CONFORMAL FUNCTIONS TENDING TO CONFORMALITY AT THE BOUNDARY,
by D. A. Storvick. 1960, 11p. Contract AF49 638 863
AFOSR , 2794

Unclassified report

Descriptors: (*Functions, Conformal mapping), (*Conformal mapping, Functions), Boundary value problems, Theorems, Complex variables, Potential theory

The purpose of this note is to show that the boundary correspondence induced by a quasi-conformal mapping is absolutely continuous and an analogue of Fatou's theorem is valid for quasi-conformal functions if one requires that the dilatation quotient in addition to being bounded tends to one sufficiently swiftly as the boundary is approached.

AD-621 223 Div. 15/1 ,30/2
CFSTI Prices: HC $3.00 MF $0.75
CALIFORNIA UNIV LOS ANGELES DEPT OF ENGINEERING
THE APPLICATION OF AN ALGORITHM FOR SEQUENTIAL OPTIMIZATION OF CONTROL SYSTEMS.
Master's thesis,
by Jerome Francis Sohler. Jul 65, 91p. Rept. no. 65-28
Contract AF AFOSR699 65

Unclassified report

Descriptors: (*Optimization, Control systems), Sequential analysis, Programming (Computers), Nonlinear systems, Calculus of variations, Trajectories

The subject of this thesis is the application of an algorithm for optimization of nonlinear control problems. The method used is the development of a digital computer program which applies the algorithm to study problems for verification of the technique. Possible extension of the theoretical developments studied is also investigated. The basic problem involves linearization of the results of a nonlinear solution about a nonoptimal control for the problem. Sequentially iterating on the improvements to the control derived by application of a linear optimization technique produces a nonlinear optimal system. The linearity of the improvement is controlled by limiting the size of the steps in the sequential optimization. The linear solution is derived by application of Pontryagin's Maximum Principle for an optimal system. A geometric approach to the solution results in a gradient technique for arriving at the optimal control for this phase of the problem. The solution of the gradient technique is accomplished by use of an acceleration scheme to provide rapid convergence to the control improvement. The final nonlinear solution is accomplished by applying the linear optimization technique in the controlled manner to the nonlinear problem.

AD-621 238 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
INTEGRAL REPRESENTATIONS FOR HARMONIC FUNCTIONS IN THREE REAL VARIABLES.
Master's thesis,
by Dorothy Graham Becker. Jan 61, 62p. Contract AF49 638 826
AFOSR , 3285

Unclassified report

Descriptors: (*Complex variables, Functions), (*Integrals, Functions), Harmonic analysis, Functional analysis, Operators (Mathematics), Partial differential equations

Let X ! (x,y,z) be a point in three-dimensional Euclidean space and f (u,v) an analytic function of two complex variables u and v; u,v and x being connected by the relation u = 1/2 (iy + z) + x ++ 1/2 (iy - z). The Whittaker-Bergman operator (1/2 pi-i) integral of f (u,v)dv/v is known to represent a complex harmonic function H in a neighborhood of some fixed point X sub 0. Bergman has described the function and its singularities in case f = v to the Kth power/ (u - iA), A a real constant. For k>0 H is a twovalued harmonic function which for k = 0 is singular along the negative x-axis in the first sheet and for A not = 0 branches along the circle x = 0, y-sq + z-sq = A-sq. The traces of the level surfaces Re H = 0 in the plane x = 0 are studied. For A = 0 such traces are rose curves of k leaves for k odd and 2k leaves for k even. For A = 1 the traces are obtained for C = =1/2, =3, =3 1/2 and for points inside and outside the circle y-sq + z-sq = 1. (Author)

AD-621 239 Div. 15/1
CFSTI Prices: HC $3.00 MF $0.75
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
PROPERTIES OF COMPLETE ORTHONORMAL SYSTEMS ON MATRIX SPACES.
Doctoral thesis,
by Shih-Hsiung Tung. Sep 62, 70p. Contract AF49 638 826
AFOSR , 3286

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Matrix algebra, Complex variables), Inequalities, Polynomials, Fourier analysis, Series, Potential theory, Boundary value problems, Theorems

In this paper properties of complete orthonormal systems on the domain D in the 2 x 2 and n x n cases were studied. The domain D is one of four main types of irreducible bounded symmetric domains given by E. Cartan. The discussion includes inequalities for polynomials on matrix spaces, equisummability of real complete orthonormal systems on the unitary group of order 2, and Harnack's theorems on matrix spaces.

AD-621 251 **See Fld. 20/4**

AD-621 258 Div. 15/1
ILLINOIS UNIV URBANA
WEAK TOPOLOGIES ON THE BOUNDED HOLOMORPHIC FUNCTIONS,
by L. A. Rubel, and A. L. Shields. 17 Aug 64, 7p. Contract AF AFOSR460 63 Proj. 9749 Task 974902
AFOSR , 65-1411

Unclassified report

Pub in Bulletin of the American Mathematical Society v71 n2 p349-52 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Topology, Functions), (*Functions, Topology), Complex variables, Functional analysis, Measure theory

G is a region in the complex plane such that there is a nonconstant bounded holomorphic function on G. The algebra of all such functions is denoted by B sub H (G). H sub infinity (G) denotes the Banach algebra that arises when B sub H (G) is endowed with the supremum norm, and beta denotes the strict topology of all bounded analytic functions in G. In this note a number of intrinsic complex-variables methods are introduced and used in conjunction with the theory of topological linear spaces to investigate the structures of beta and B sub H (G). The main new tool used is the balayage, or sweeping, of measures. Main results are presented, without proof. (Author)

AD-621 259 Div. 15/1
ILLINOIS UNIV URBANA
BOUNDED APPROXIMATION BY POLYNOMIALS,
by L. A. Rubel, and A. L. Shields. 22 Apr 63, 6p. Contract AF AFOSR460 63 Proj. 9749 Task 974902
AFOSR , 65-1413

Unclassified report

Pub. in Bulletin of the American Mathematical Society v69 n4 p591-3 Jul 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Functional analysis, Polynomials), (*Polynomials, Functional analysis), Sequences, Complex variables, Numerical analysis, Theorems

For an arbitrary bounded open set in the complex plane, the problem is considered of which complex-valued functions in the set can be obtained as the bounded pointwise limits of a sequence of polynomials. The following theorem is presented: Given an arbitrary bounded open set G in the complex plane, and a complex-valued function f defined on G. There exists a sequence of polynomials that are uniformly bounded on G and that converge pointwise on G to f if and only if f has an extension F that is bounded and holomorphic on G*, where G* is the inside of the outer boundary of G. Since the proof for the general case is long and complicated, only the proof for the special case when G is connected is presented. (Author)

AD-621 264 Div. 15/1
HEBREW UNIV JERUSALEM (ISRAEL)
A COUNTEREXAMPLE TO A PROBLEM OF SZ.-NAGY.
Revised ed.,
by S. R. Foguel. 2 May 63, 5p. Contract AF EOAR27 65 Proj. 9749 Task 974902
AFOSR , 65-1403

Unclassified report

Pub. in Proceedings of the American Mathematical Society v15 n5 p788-90 Oct 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 21 Dec 62.

Descriptors: (*Operators (Mathematics), Matrix algebra), Transformations (Mathematics), Sequences, Functions

An operator in a Hilbert space with uniformly bounded powers is constructed which is not similar to a contraction. This furnishes a negative answer to a surmise made by Sz.-Nagy in a former paper that if T is an operator in euclidean space, not invertible, such that its iterates have a common bound, T is similar to a contraction. (Author)

AD-621 265 **See Fld. 20/3**

AD-621 269 **See Fld. 18/9**

AD-621 273 Div. 15/1 ,25/8
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
INVESTIGATION OF ACCELERATING THE CONVERGENCE OF AN IMPLICIT NUMERICAL SOLUTION OF TRANSIENT HEAT TRANSFER PROBLEMS.
Master's thesis,
by George Francis Cudahy. Aug 65, 82p. Rept. no. GA/PH/65-4-A

Unclassified report

Descriptors: (*Heat transfer, Numerical analysis), (*Numerical analysis, Heat transfer), Partial differential equations, Difference equations, Optimization, Thermal conductance

This study investigates two methods of increasing the rate of convergence of the two dimensional five point implicit finite difference representation of the diffusion equation of transient heat transfer. The two methods are adapted Wegstein and successive overrelaxation. Various techniques of scanning the mesh system formed by the finite differences and an 'a priori' overrelaxation factor are also investigated. An example problem is used to determine that successive overrelaxation with a sophisticated technique of repeatedly scanning all boundary values of the problem into the finite difference mesh is the fastest system of those tested to solve the implicit simultaneous equations of this study. The solutions of twenty-eight (28) other problems by this same system show that an average of 35.2% savings in number of iterations to solution is realized by this system as compared to successive overrelaxation with a conventional repetitive scanning technique. An 'a priori' relaxation factor which is related to the maximum temperature gradients of the problem is obtained. This 'a priori' factor is within 10% of the optimum relaxation factors for all problems and is an accurate approximation for those problems without heat generation. (Author)

AD-621 274 Div. 15/1 ,25/8
CFSTI Prices: HC $4.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
AN ERROR ANALYSIS OF NUMERICAL SOLUTIONS OF THE TRANSIENT HEAT CONDUCTION EQUATION.
Master's thesis,
by Donald B. Mitchell. Aug 65, 111p. Rept. no. GA/PH/65-10

Unclassified report

Descriptors: (*Numerical analysis, Errors), (*Heat transfer, Partial differential equations), (*Partial differential equations, Numerical analysis), Thermal conductivity, Convection, Difference equations, Programming (Computers)

In this investigation the transient temperatures in a semi-infinite slab with a convective boundary layer are determined numerically using the Crank-Nicolson and Crandall Methods. These temperatures are compared with the exact solution to determine if the Crandall technique, as theoretically predicted, has smaller truncation error. A finite difference boundary equation is derived for the convective boundary condition which is consistent with the internal node formula developed by Crandall. The latter formula and the derived boundary equation are used to obtain six node temperatures at six time intervals for values of M (inverse Fourier modulus) equal to 1, 2, 3, 4, and the square root of 20; and N (Nusselt modulus) equal to 2, 1/2, 1/4, and 1/8. The results show that these temperatures are always more accurate than those obtained using the Crank-Nicolson Method if the nodes are closely spaced (N equal to 1/8). In addition, the solutions for those values of M and N which permit the boundary equation truncation error to be minimized indicate that the Crandall Method is more accurate if N is less than or equal to 1/2. The accuracy improvement factors for the two numerical methods are also determined; however, the results do not agree with those predicted theoretically and show no consistent trends. Also, the equation required to apply the Crandall technique to bodies with variable thermal properties is derived. (Author)

AD-621 287 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY ROTATION-DESCRIPTIVE SOLUTION.
Technical seminar series,
by C. Ernesto S. Lindgren. Mar 65, 26p. Rept. no. TSS-3

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

The paper presents the solution, by descriptive geometry methods, of some of the problems in rotation. Related problems, such as the determination of the point of intersection of a line and a 3-D space, are also discussed. (Author)

AD-621 288 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY PROBLEMS ON 3-D SPACES.
Technical seminar series,
by C. Ernesto S. Lindgren. Mar 65, 35p. Rept. no. TSS-4

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

The paper presents new solutions of five problems in four-dimensional descriptive geometry. These problems were briefly discussed in previous papers. The new solutions have already been used in papers preceding this one but were not fully examined. (Author)

AD-621 289 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
GRAPHICAL PLOTTING OF DATA. AN APPLICATION OF THREE AND FOUR DIMENSIONAL THEORETICAL DESCRIPTIVE GEOMETRIES.
Technical seminar series,
by C. Ernesto S. Lindgren. Mar 65, 42p. Rept. no. TSS-5

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), (*Graphics, Projective geometry), Differential geometry, Drafting, Geometry

The paper introduces new methods of graphical plotting by means of theoretical four-dimensional descriptive geometry, re-introduces known methods derived from theoretical three-dimensional descriptive geometry and compares the latter with the usual two-dimensional plotting characterized by a third parameter to indicate the three-dimensionality of the representation. (Author)

AD-621 290 Div. 15/1
CFSTI Prices: HC $2.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY METRIC PROBLEMS: ANGLES-DESCRIPTIVE SOLUTION.
Technical seminar series,
by C. Ernesto S. Lindgren. May 65, 46p. Rept. no. TSS-6

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

The paper presents the descriptive geometry solution of the determination of the angles between geometric elements in a four-dimensional euclidean space. Incorporated in these solutions are the discussions of some problems of intersections between two geometric elements. These are: intersection of a line and a plane, belonging to the same 3-D space; intersection of two planes belonging to distinct 3-D spaces; intersection of a line and a 3-D space; intersection of a plane and a 3-D space. (Author)

AD-621 291 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY PROPOSITION OF A PROBLEM.
Technical seminar series,
by C. Ernesto S. Lindgren. Jun 65, 9p. Rept. no. TSS-7

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

The paper proposes the determination of the coordinates of the point of a plane, in a four-dimensional space, equidistant to three 3-D spaces of the system of reference for the Four-Dimensional Descriptive Geometry. (Author)

AD-621 292 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY METRIC PROBLEMS: DISTANCES.
Technical seminar series,
by C. Ernesto S. Lindgren. Jun 65, 14p. Rept. no. TSS-8

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

The paper presents the determination, in orthographic projections, of the true length of the distance between two given geometric elements in a four-dimensional space. (Author)

AD-621 293 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
PRINCETON UNIV N J DEPT OF GRAPHICS AND ENGINEERING DRAWING
FOUR-DIMENSIONAL DESCRIPTIVE GEOMETRY PROPOSED PROBLEMS.
Technical seminar series,
by C. Ernesto S. Lindgren. Jul 65, 6p. Rept. no. TSS-9

Unclassified report

Rept. on Engineering Graphics Seminar.

Descriptors: (*Projective geometry, Graphics), Differential geometry, Drafting, Geometry

There are many concepts in Four-Dimensional Synthetic Geometry that should be analyzed under the light of the Four-Dimensional Descriptive Geometry. In this paper such analysis is suggested in the form of problem proposition. (Author)

AD-621 294 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS
ALGEBRA ANALYSIS.
Final rept.,
by R. S. Pierce. 31 Aug 65, 4p. Contract Nonr468300 Proj. NR043 321

Unclassified report

Descriptors: (*Algebra, Mathematical analysis), (*Mathematical analysis, Algebra), Groups (Mathematics), Inequalities, Functions, Transformations (Mathematics)

During the term of this contract, research was done in several areas of mathematical analysis. Included in this was research on Abelian group theory, work in Function Algebras, Inequalities involving analytic functions and Inequalities arising in the study of doubly stochastic transformations. The results are summarized below.

AD-621 304 Div. 15/2
CFSTI Prices: HC $3.00 MF $0.75
STANFORD UNIV CALIF DEPT OF STATISTICS
ON EMPIRICAL MULTIPLE TIME SERIES ANALYSIS.
Technical rept.,
by Emanuel Parzen. 19 Jul 65, 70p. Rept. no. TR-3
Contract Nonr22580 Grant ,NSF GP4265 Proj. NR042 234

Unclassified report

See also AD-617 937.

Descriptors: (*Statistical analysis, Series), (*Sampling, Theory), (*Series, Statistical analysis), Multiple operation, Probability, Statistical analysis

It is natural to think of the theory of time series analysis as composed of two parts, foundations (a probabilistic part involving deep mathematics and based on the unrealistic assumption that one knows the probability law of the time series) and empirical (in which one considers statistical and computational procedures). This paper outlines the problem of empirical multiple time series analysis, indicates some theoretical questions which require further investigation, presents a unified but heuristic exposition of crossspectral analysis, and states some new results on the asymptotic sampling theory of partial cross-spectra. (Author)

AD-621 322 **See Fld. 15/7**

AD-621 352 Div. 15/1
STANFORD UNIV CALIF DEPT OF MATHEMATICS
ESTIMATES FOR THE TRANSFINITE DIAMETER OF A CONTINUUM,
by Edgar Reich, and Menahem Schiffer. 24 Apr 64, 18p. Contract AF49 638 1345 Grant ,NSF GP1989
AFOSR , 65-1399

Unclassified report

Pub. in Mathematica Zeitschrift v85 p91-106 1964. (Copies available only to DDC users). Prepared in cooperation with Minnesota Univ., Minneapolis. Dept. of Mathematics.

Descriptors: (*Conformal mapping, Geometry), (*Geometry, Calculus of variations), Inequalities, Complex variables, Differential equations

Some estimates for the transfinite diameter of a continuum are derived in terms of elementary geometric quantities connected with it. The main intention is methodological. Variational methods are applied, and the corresponding extremum continua are described by a functional differential equation. In all cases the determination of the extremum continuum is based on rather simple geometric arguments. It is intended that the arguments used should indicate more general methods of solution which could be applied in the calculus of variations for conformal mappings. (Author)

AD-621 358 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
TASMANIA UNIV HOBART (AUSTRALIA) DEPT OF MATHEMATICS
ALGORITHMS FOR THE NUMERICAL SOLUTION OF LINEAR INTEGRAL EQUATIONS OF THE SECOND KIND.
Technical rept.,
by David Elliott, and W. G. Warne. Apr 65, 24p. Rept. no. TR-7
Contract AF AFOSR660 64 Proj. 9749 Task 974901
AFOSR , 65-1359

Unclassified report

Descriptors: (*Integral equations, Numerical methods and procedures), Series, Programming languages, Boundary value problems

Two algorithms suitable for the solution of nonsingular, linear Fredholm and Volterra integral equations of the second kind are described in detail. These algorithms make extensive use of Chebyshev series expansions. After a general statement of the algorithms and a discussion of their use, the algorithms are given as procedures written in ALGOL. (Author)

AD-621 360 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
CALIFORNIA UNIV BERKELEY DEPT OF MATHEMATICS
WALSH FUNCTIONS, NORMAL NUMBERS AND PSEUDO-RANDOM FUNCTIONS.
Technical rept.,
by Michel M. France. Sep 65, 21p. Contract Nonr22260 Proj. 041 221

Unclassified report

Descriptors: (*Number theory, Functions), Pseudorandom systems, Groups (Mathematics), Sequences, Complex variables

The so-called Walsh functions are considered. They are defined as a character on the abelian group (Z/gZ) to the Nth power (g is a given integer > or = 2). A characterization is obtained of normal numbers by applying Weyl's criteria on uniformly distributed sequences on a group. It is shown that the Walsh functions are pseudo-random functions whose energetic spectral density is singular. (Author)

AD-621 392 Div. 15/2 ,30/1 ,32/7
CALIFORNIA UNIV BERKELEY STATISTICAL LAB
PROBABILITY AND THE EAST.
Technical rept.,
by Edward W. Barankin. 1964, 47p. Contract Nonr22243 Proj. NR042 036

Unclassified report

Pub. in Annals of the Inst. of Statistical Mathematics v16 p185-230 1964 (Copies available only to DDC users).

Descriptors: (*Probability, Symposia), Mathematical logic, Scientific research, Stochastic processes, Japan, Social sciences

Following discourses on the nature of probability, from aspects of mathematics, economics, and human behavior, and of the Orient, the belief is propounded that the next big step in the progress of fundamental scientific theory will be distinctly oriental in character. Reference is made to the books of Arthur Koestler 'The Sleepwalkers' and 'The Lotus and The Robot' that declare (1) The difficulties of modern times are caused by the disparity between science and religion and (2) Europe as well as Asia should try to answer the 'perplexities and deadlocked problems.'

AD-621 402 See Fld. 20/12

AD-621 412 Div. 15/1
PRINCETON UNIV N J
HOMOLOGY THEORY FOR LOCALLY COMPACT SPACES,
by A. Borel, and J. C. Moore. 12 Nov 59, 24p.
Contract AF49 638 431
AFOSR , 3386

Unclassified report

Pub. in Michigan Mathematical Journal v7 p137-59 1960 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Algebraic topology, Theory)

AD-621 425 Div. 15/1 ,30/3
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
NEW METHOD .OF DETERMINING THE LIAPUNOV FUNCTIONS (NOVYI SPOSIB VYZNACHENIIA FUNKTSII LIAPUNOVA).
Research translation,
by V. I. Antipenko. Sep 65, 11p. Rept. no. T-U-5
Contract AF19 628 3880
TT , 65-63978

Unclassified report

Trans. of Avtomatyka (USSR) v9 n2 p71-5 1964.

Descriptors: (*Functional analysis, Differential equations), (*Differential equations, Functional analysis), Stability, Differential geometry, Nonlinear systems, Automatic, USSR

The proposed new method is one for determining the Liapunov functions in the more general form required for investigating the stability of nonlinear automatic systems. The distinctive feature of the system is that no limitations are imposed on the type of Liapunov functions, and the Liapunov function is found objectively by solving a system of differential equations. An algorithm is proposed for formulating the indicated differential equations.

AD-621 428 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
A CONFIDENCE INTERVAL COMPARISON OF TWO TEST PROCEDURES PROPOSED FOR THE BEHRENSFISHER PROBLEM,
by S. James Press. Sep 65, 20p. Rept. no. P-2999-1

Unclassified report

Prepared in cooperation with Stanford Univ., Calif., under Grant NSF GP214.

Descriptors: (*Statistical tests, Effectiveness), Series, Statistical analysis, Numerical analysis

The procedures of Scheffe and Welch for testing equality ofmeans are compared according to the expected lengths of the confidence intervals they yield, and a criterion is developed for deciding which of the two methods is better in any given situation. An expression for the expected length of the confidence interval for the Scheffe procedure was developed by Scheffe. Because of the asymptotic series nature of the Welch procedure, in this case, the analogous expression is more involved. It is developed below. Graphs are provided to summarize the numerical results. Finally, it is shown that in large samples, the two procedures are equivalent. (Author)

AD-621 436 See Fld. 5/10

AD-621 445 Div. 15/2
PRINCETON UNIV N J
BAYESIAN INFERENCE CONCERNING MANY PARAMETERS WITH REFERENCE TO SUPERSATURATED DESIGNS,
by F. J. Anscombe. 1963, 12p.

Unclassified report

Pub. in Bulletin of the ISI 34th Session Ottawa 1963 (Copies available only to DDC users).

Descriptors: (*Combinatorial analysis, Statistical data), Probability, Experimental data, Decision theory

AD-621 455 Div. 15/1 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
QUASILINEARIZATION, INVARIANT IMBEDDING, AND THE CALCULATION OF EIGENVALUES,
by Richard Bellman, Harriet Kagiwada, and RobertKalaba. Sep 65, 20p. Rept. no. RM-4738-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Neutron transport theory, Invariance), (*Boundary value problems, Neutron transport theory), (*Numerical analysis, Boundary value problems), Differential equations, Integral equations, Sequences, Transport properties, Electromagnetic waves

Several eigenvalue problems for systems of ordinary differential equations are considered. They are resolved computationally using the quasilinearization technique, a quadratically convergent successive approximation scheme. The essential idea presented is to consider an eigenvalue problem to be a system identification problem. Also shown is the use of invariant imbedding techniques to obtain good initial estimates for eigenvalues in some neutron multiplication processes. (Author)

AD-621 476 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
EXTREME POINT SOLUTIONS IN MATHEMATICAL PROGRAMMING: AN OPPOSITE SIGN ALGORITHM.
Systems research memo.,
by Abraham Charnes, Kenneth O. Kortanek, and William M. Raike. Jun 65, 16p. Rept. no. SRM-129
Contract Nonr122810 ,DA31 124ARO D322
Proj. NR047 021

Unclassified report

Revision of research memo. ONR-84 and SRM-104 Prepared in cooperation with Chicago Univ., Ill. Prepared for presentation at the TIMS meeting at Dallas, Tex., Feb 66.

Descriptors: (*Mathematical programming, Optimization), Complex variables, Linear programming, Nonlinear programming, Programming (Computers), Programming languages

Several important and efficient methods of solution of specific types of linear programming problems have the feature of sometimes providing optimal solutions which are not extreme-point (or basic) solutions, so that important and useful analyses provided by knowledge of the optimal dual evaluators are not available. It is also often desirable to be able to begin with a solution suggested by knowledgeable persons with experience in the field (or other considerations) and to proceed immediately to a basic solution at least as good as the suggested one. In this paper it is shown how part of the technique of proof of the opposite sign theorem can be employed in a simple algorithm to achieve this end. This method is equally valid when maximizing a nonlinear but convex objective function. A tested ALGOL code is provided for executing the algorithm in a manner compatible (as a procedure) with other programs. (Author)

AD-621 507 Div. 15/1
HARVARD UNIV CAMBRIDGE MASS
IRREDUCIBLE SUBVARIETIES AND RATIONAL POINTS.
Revised ed.,
by Newcomb Greenleaf. 6 Aug 64, 11p. Contract DA31 124ARO D128
AROD , 1617:48

Unclassified report

Pub. in American Journal of Mathematics, v87 n1 p25-31 Jan 1965. (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 22 Nov 63.

Descriptors: (*Algebraic geometry, Theorems), Polynomials, Number theory

A conjecture by Lang, 'Finally, to go back to number fields, it seems to me reasonable to expect that a form n>d at least has a non-trivial zero in all but a finite number of P-adic fields', is proven by elementary considerations of algebraic geometry.

AD-621 512 See Fld. 5/1

AD-621 527 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
SUMT WITHOUT PARAMETERS.
Systems research memo.,
by Anthony V. Fiacco, and Garth P. McCormick. Apr 65, 17p. Rept. no. SRM-121
Contract Nonr122810 Proj. NR047 021 ,NIH EF00355 03

Unclassified report

See also AD-423 903.

Descriptors: (*Nonlinear programming, Optimization), Calculus of variations, Functions, Sequences

The paper gives a variation of the Sequential unconstrained minimization technique (SUMT) for nonlinear programming. A new penalty function is introduced that can provide the required transformation for converting the original constrained problem into a sequency of unconstrained problems. The new feature is essentially that the objective function is treated as a moving constraint. Proof of convergence is given. The relationship between the new function and the one presently utilized in SUMT is specified in detail. The new function has a number of advantages such as the fact that it is free of dependence on parameters and is such as to force a decrease in the functional being minimized, from the given initial feasible point. Preliminary computational results, using an algorithm based on the function, indicated correct convergence. To date, however, the technique has not been tested adequately to draw any firm conclusions as regards its computaticnal efficacy as compared to the present version of SUMT. (Author)

AD-621 536 Div. 15/1
JOHNS HOPKINS UNIV BALTIMORE MD
ON THE LEFSCHETZ FIXED POINT FORMULA.
Revised ed.,

by Robert F. Brown. 18 Sep 64, 16p. Contract AF AFOSR90 63 Proj. 9749 Task 974902 AFOSR , 65-1408

Unclassified report

Pub. in American Journal of Mathematics v87 n1 p1-10 Jan 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 22 Nov 63. Prepared in cooperation with American Mathematical Society, Providence, R. I.

Descriptors: (*Algebraic topology, Theorems), Mapping (Transformations)

AD-621 550 Div. 15/1
CFSTI Prices: HC $1.00 MF $0.50
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
COMMENT ON GENERALIZED UPPER BOUNDED TECHNIQUES IN LINEAR PROGRAMMING.
Research rept.,
by R. N. Kaul. Jul 65, 15p. Rept. no. ORC-65-21
Contract Nonr22283 ,DA31 124ARO D331 Proj. NR047 033 ,RR003 07 01

Unclassified report

Descriptors: (*Linear programming, Optimization), Theorems, Set theory, Iterative methods, Matrix algebra, Operations research

Dantzig and Van Slyke (AD-610 950) have proved a theorem that gives an upper bound on the number of sets containing at least two basic variables. This fact is exploited to develop an algorithm that is computationally efficient for a large scale system with a special structure. It is possible to show that this bound can be improve. The significance of this improvement lies in the fact that since it is related to the order of the working basis, the computation can be carried out with a basis of order less by one than that considered in the above. The purpose of this note is to describe it and illustrate by an example. (Author)

AD-621 562 Div. 15/1
NEW YORK UNIV N Y
STABILITY PROBLEMS FOR SYSTEMS OF LINEAR DIFFERENTIAL EQUATIONS,
by Martin Segal. Sep 63, 15p. Contract AF AFOSR62 108
AFOSR , 65-1407

Unclassified report

Pub. in Communications on Pure and Applied Mathematics v17 n4 p401-14 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stability, Differential equations), (*Differential equations, Stability), Hamiltonian, Matrix algebra, Real variables, Differential geometry

AD-621 569 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
PROGRAMMING UNDER UNCERTAINTY: THE SOLUTION SET.
Mathematical note,
by Roger Wets. Aug 65, 19p. Rept. no. MN-424, D1-82-0464

Unclassified report

Also available from the author.

Descriptors: (*Linear programming, Probability), (*Probability, Linear programming), (*Convex sets, Linear programming), Decision theory, Statistical functions, Matrix algebra

In a previous paper (AD-612 896), the author described and characterized the equivalent convex program of a twostage linear program under uncertainty. It was proven that the solution set of a linear program under uncertainty is convex and derived explicit expressions for this set for some particular cases. The main result of this paper is to show that the solution set is not only convex but also polyhedral. It is also shown that the equivalent convex program of a multi-stage programming under uncertainty problem is of the form: Minimize a convex function subject to linear constraints. (Author)

AD-621 570 Div. 15/2
CFSTI Prices: HC $1.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH MATHEMATICS RESEARCH LAB
CHARACTERIZATION OF GEOMETRIC AND EXPONENTIAL DISTRIBUTIONS.
Mathematical note,
by Gordon B. Crawford. Aug 65, 14p. Rept. no. MN-421 ,D1-82-0461

Unclassified report

Also available from the author. See also AD-401 549.

Descriptors: (*Distribution theory, Stochastic processes), (*Statistical distributions, Geometry), Theorems, Measure theory, Real variables

In two works T. S. Ferguson examines the classes of independent random variables X and Y such that min (X,Y) is independent of X - Y. In one work he shows that if X (or Y) has a discrete part, then X and Y are geometric random variables. In the other work it is shown that if X and Y are absolutely continuous, then they are exponential random variables. The present author intends to complete this investigation by showing that the result of Ferguson holds even if X and Y are possibly singular.

AD-621 579 Div. 15/1 ,30/5
CFSTI Prices: HC $2.00 MF $0.50
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
AN ADAPTIVE AGE REPLACEMENT POLICY,
by Bennett L. Fox. Jun 65, 48p. Rept. no. ORC-65-17
Contract Nonr365618

Unclassified report

Descriptors: (*Replacement theory, Failure (Mechanics)), (*Aging (Materials), Replacement theory), Operations research, Dynamic programming, Optimization, Costs, Maintenance

Under an age replacement policy we replace at failure or at the end of a specified time interval, whichever occurs first. This makes sense if a failure replacement costs more than a planned replacement and the failure rate is strictly increasing. We assume that the failure distribution is a Weibull distribution with known shape parameter (greater than one) and unknown scale parameter. Moreover, we assume that a natural conjugate prior distribution with specified parameters is at hand which we modify after each stage according to Bayes' rule. Our policy adapts to the changing prior. We see intuitively that the larger the replacement interval set, the more information we are likely to obtain. We take account of this in a precisely defined manner via dynamic programming. The optimal policy is partially characterized and various limiting results are obtained. (Author)

AD-621 581 Div. 15/1 ,7/5
CFSTI Prices: HC $2.00 MF $0.50
NUMERICAL ANALYSIS RESEARCH UNIV OF CALIFORNIA LOS ANGELES
A DELIVERY PROBLEM.
Technical rept.,
by Marie-Claude Roubault. Sep 65, 22p. Rept. no. 65-1
Contract Nonr23376 Proj. NR044 144 Task 76

Unclassified report

Descriptors: (*Graphics, Theory), (*Electrical network, Transmission lines), Inequalities, Topology, Linear programming, Operations research, Numerical analysis

Let there be given a graph from which is to be extracted a certain forest F which contains every node s and is such that on each node certain given inequalities, depending on s and F, are satisfied. The procedure proposed consists in building a sequency of forests containing every node and such that all the required constraints are satisfied for the last element of the sequence. This problem is an abstract version of the problem of efficient delivery of electrical power in a geographically extended network. (Author)

AD-621 582 Div. 15/1
CFSTI Prices: HC $4.00 MF $0.75
NUMERICAL ANALYSIS RESEARCH UNIV OF CALIFORNIA LOS ANGELES
ACCELERATION OF THE CONVERGENCE OF THE KACZMARZ METHOD AND ITERATED HOMOGENEOUS TRANSFORMATIONS.
Technical rept. (Doctoral thesis),
by James Dyer. 1965, 106p. Rept. no. 65-2
Contract Nonr23376 Proj. NR044 144

Unclassified report

Descriptors: (*Transformation (Mathematics), Iterative methods), (*Iterative methods, Transformations (Mathematics)), Measure theory, Functional analysis, Operators (Mathematics), Numerical analysis, Matrix algebra

The Kaczmarz method is a well known and computationally easily constructed iterative method for solving a system of linear equations. Convergence is normally slow due to the presence of an eigenvalue with modulus close to unity. Two related methods of accelerating this convergence are considered. The accelerated transformations are nonadditive and homogeneous. In a natural way arises the question of defining suitable finite and asymptotic rates of convergence for certain convergent nonlinear homogeneous transformations. The rate of convergence problem is re-examined for linear transformations and a new average rate for a finite number of iterations is defined. Aspects of Ergodic theory are discussed in connection with an important class of linear transformations. Classes of homogeneous transformations are defined to which the theory of rate of convergence can be extended. Ergodic theorems are proved concerning certain homogeneous transformations in the plane. The relationship of the Kaczmarz operator to the Gauss-Seidel operator is recalled and some aspects of the Young overrelaxation theory are applied to the former. The dissertation concludes with some graphed results showing the effect of accelerating the convergence of the Kaczmarz method. (Author)

AD-621 605 Div. 15/1
CHICAGO UNIV ILL
ON A THEOREM OF GOLDIE,
by Claudio Procesi, and Lance Small. 24 Jul 64, 6p. Contract DA ARO D31 124G501
AROD , 4197:1

Unclassified report

Pub. in Journal of Algebra v2 n1 p80-4 Mar 1965 (Copies available only to DDC users).

Descriptors: (*Theorems, Rings), (*Rings, Theorems), Algebra

The theorems proven are: (1) Let R be a semiprime (left) Goldie ring; then R has a left quotient ring Q; and (2) Q is a semisimple ring satisfying the descending chain condition on left ideals.

AD-621 612 **See Fld. 20/8**

13/1. AIR CONDITIONING, HEATING, LIGHTING, AND VENTILATING

AD-620 809 Div. 13/1 ,10/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

BURNER FOR COMBUSTION OF LIQUID FUELS,
by I. A. Bronnikov. 18 Aug 65, 5p. Rept. no. FTD-TT-65-1111
TT, 65-63852

Unclassified report

Unedited rough draft trans. of Russian patent 166 985, pub. 17 Jan 63, appl. 814012/24-6, 2p.

Descriptors: (*Furnaces, Fuels), (*Fuels, Combustion), Steam, Diffusers, Atomization, Nozzle gas flow, Patents, USSR, Liquids

Object of the invention: Burner for combustion of liquid fuels in industrial furnaces, containing body with nipple for the supply of air, louver for controlling its delivery and two coaxially arranged tubes - inner, having axial displacement, for the delivery of primary atomizer (steam) and outer for the delivery of fuel, characterized by the fact, that for the purpose of improving the quality of fuel atomization and reduce its specific consumption, the output end of the inner tube is provided with a screwshaped turbulator and is situated in front of diffuser, mounted on outer tube. (Author)

AD-621 483 **See Fld. 14/2**

13/2. CIVIL ENGINEERING

AD-620 957 **See Fld. 2/3**

AD-621 045 Div. 33/2 ,11/2 ,13/4
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
PERFORMANCE OF SOILS UNDER TIRE LOADS: ANALYSIS OF TESTS IN YMA SAND THROUGH AUGUST 1962.
Rept. no. 2,
by C. J. Powell, and A. J. Green. Aug 65, 169p.
Rept. no. TR-3-666
Proj. 1V021701A046 Task 1V021701A04603

Unclassified report

Available copy for sale by U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., HC$2.00., MF$1.00 available from CFSTI.

Descriptors: (*Tires, Trafficability), (*Soil mechanics, Trafficability), (*Sand, Trafficability), Roads, Deserts, Vehicles, Traffic, Load distribution, Military requirements, Desert tests, Arizona, Transportation, Civil engineering

A total of 709 tests performed with single pneumatic tires in Yuma desert sand placed in movable sand bins in the laboratory are analyzed. Basic plots are presented to show the correlations obtained between individual variables. Representative cross plots are included to show the effects of tire width and diameter and to illustrate the relative effectiveness of the various tires tested. Initial steps in the development of a numeric that will define a single relation between dependent and independent variables for all tires and test conditions are reported. (Author)

AD-621 177 Div. 13/3
CFSTI Prices: HC $1.00 MF $0.50
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION MELBOURNE (AUSTRALIA) DIV OF BUILDING RESEARCH
CALCULATION OF SOLAR POSITION FOR BUILDING PURPOSES.
Technical paper,
by J. W. Spencer. 1965, 18p. Rept. no. TP-14

Unclassified report

See also AD-621 178.

Descriptors: (*Sun, Astronomical geodesics), (*Astronomical geodesics, Civil engineering), (*Civil engineering, Astronomical geodesics), Mathematical analysis, Solar radiation, Australia

The paper describes the derivation and application of methods of calculating solar altitude, azimuth, angle of incidence, shadow angles, and sunrise and sunset times from standard astronomical and geographic data and includes a description of such fundamental concepts in astronomy as are required for understanding the methods. It provides an extended explanation of solar position tables that have been computed by these methods for various Australasian localities for the use of building designers and air-conditioning engineers. (Author)

AD-621 221 Div. 33/2 ,30/5 ,11/2
CFSTI Prices: HC $0.75
OHIO RIVER DIV LABS ENGINEER CORPS CINCINNATI
PHOTOELASTIC STUDIES FOR VEHICLE MOBILITY RESEARCH.
Final rept.,
by F. M. Mellinger, J. H. Hubbard, and R. L. Peters. Aug 65, 78p. Proj. DA 1V0 21701A046 Task 1V0 21701A046 03
AEWES, 3-118

Unclassified report

Hardcopy available from U. S. Army Engineer Waterways Experiment Station, Corps of Engineers, Vicksburg, Miss., $0.75, as Contract Rept. no. 3-118.

Descriptors: (*Gelatin, Photoelasticity), (*Trafficability, Model tests), (*Vehicle wheels, Loading (Mechanics)), Stresses, Motion, Spin, Loading (Mechanics), Test methods, Soils

The test procedures and techniques developed in the studies reported herein provide a means of obtaining photoelastic stress patterns for moving wheel loads at controlled degrees of slip. Sufficient information was developed to compute normal and shear stress distribution on planes in the gelatin foundation within one-fourth inch of the contact surface between the moving wheel load and gelatin, if certain approximations are made. Further study is indicated to accurately define the stress at a point. Concerning the action of the static and moving wheel loads on the gelatin model, it was found that there was an increase in maximum shear stress for the moving wheel load at 0, +25% and +50% slip over that of an equivalent static wheel load. This increase in maximum shear stress was due to a redistribution of normal stress at the wheel contact with the gelatin. Also, the maximum shear stress under the action of the moving wheel load was greater at 0 slip than at +25% and +50% slip. (Author)

AD-621 248 Div. 13/3 ,2/9
CFSTI Prices: HC $3.00 MF $0.75
BUREAU OF RECLAMATION DENVER COLO HYDRAULICS BRANCH
HYDRAULIC MODEL STUDIES OF THE CANAL TRANSITION AT THE FOREBAY PUMPING PLANT, SAN LUIS UNIT CENTRAL VALLEY PROJECT, CALIFORNIA,
by D. L. King. 15 Jun 65, 74p. Rept. no. Hyd-542

Unclassified report

Descriptors: (*Hydraulic models, Inland waterways), (*Inland waterways, Configuration), (*Irrigation systems, Dams), Pumps, Water supplies, Hydraulic pressure pumps, Design, Velocity, Structures, Computers, Industrial plants, California

Hydraulic model studies of 2 intake channel transition designs for the Forebay Pumping Plant in San Luis Unit, CVP, showed that the hydraulic advantages of a symmetrical transition were not great enough to outweigh the economic advantages of an angled transition. Because the pumping plant location and alinement were fixed by geologic conditions a straight-in approach could not be used; therefore 2 alternative schemes for the Forebay Canal alinement and transition configuration were studied by comparing velocity distributions, head losses, and surface flow patterns on a 1:15-scale model. Velocity distribution comparison indicated that a symmetrical transition with curved approach was preferable to an angled transition with straight canal alinement. Although the symmetrical transition showed slightly more desirable flow patterns, the strength of eddy currents occurring along the transition sides appeared to be the same for both types. Head loss difference between the 2 types was too small to justify comparison on this basis. The symmetrical transition exhibited less tendency to form vortices between the intake piers. Both types could possibly be improved by modifying the design--that is, widening the canal bottom or including vertical sidewalls at the pumping plant. The symmetrical transition, although hydraulically preferable, would require additional excavation and a longer approach canal, resulting in higher costs. (Author)

AD-621 249 **See Fld. 13/13**

AD-621 438 Div. 13/3 ,2/8 ,2/1
CFSTI Prices: HC $7.00 MF $1.75
SPACE AND INFORMATION SYSTEMS DIV NORTH AMERICAN AVIATION INC DOWNEY CALIF
A STUDY OF THE FEASIBILITY OF USING NUCLEAR VERSUS SOLAR POWER IN WATER EXTRACTION FROM ROCKS.
Final rept. for 5 Jul 63-30 Sep 65,
by J. Green. 30 Sep 65, 371p. Rept. no. SID-65-1085
Contract AF19 628 3292 Proj. 0000 ,CRL004 Task 000011
AFCRL, 65-596

Unclassified report

Descriptors: (*Water supplies, Moon), (*Moon, Water supplies), (*Nuclear reactors, Water supplies), (*Solar furnaces, Water supplies), (*Lunar bases, Water supplies), Lunar environment, Rock (Geology), Hydrology, Minerals, Analysis, Heat exchangers, Power supplies, Thermionic converters, Hygrometers, Petrography, Feasibility studies

Relative to the extraction of water from predicted lunar surface materials, use of solar energy is recommended during early LESA missions, phasing into nuclear energy in later LESA missions. A heat transfer loop common to both systems is evaluated. Various geological and heat transfer problems that pertain to reactor and solar heat sources, as well as the engineering and logistics aspects of water extraction systems, are investigated. Welded tuffs and altered volcanics are believed to be among the best source materials for water in lunar-basing operations. (Author)

AD-621 514 **See Fld. 13/6**

13/4. CONTAINERS AND PACKAGING

AD-621 541 Div. 26/7
CFSTI Prices: HC $1.00 MF $0.50
ARMY WEAPONS COMMAND ROCK ISLAND ILL RESEARCH AND ENGINEERING DIV
MVTR VS CORROSION IN MILITARY PACKAGING.
Technical rept.,
by Lynden W. Lynch. Aug 65, 18p. Rept. no. 65-1925
Proj. DA 1C024401A110

Unclassified report

Descriptors: (*Packaging, Corrosion inhibition), (*Packing materials, Moistureproofing), (*Corrosion inhibition, Packaging), Military requirements, Films, Plastics, Moisture, Permeability, Corrosion, Storage, Tests

In normal level A packaging the moisture is excluded through the use of packaging material characterized by an extremely low moisture vapor

transmission rate and a water repellant preservative. A series of tests were conducted to determine the relationship of the MVTR of packaging materials to the protection afforded packaged items. These tests consisted of (a) packaging small steel panels in bags composed of various packaging materials with either a pseudo-preservative or no preservative and (b) storing the completed package at various conditions of temperature and humidity with periodic examination for evidence of corrosion on the steel panels. Data taken from these tests demonstrates the inability of even the best packaging materials, in the absence of an effective preservative, to protect against corrosion for any appreciable period of time when stored under corrosive conditions. It is concluded, therefore, that the MVTR of the packaging material is unimportant to the protection of corrosive items since such protection must be provided by a preservative. (Author)

13/6. GROUND TRANSPORTATION EQUIPMENT

AD-620 936 **See Fld. 1/3**

AD-620 964 **See Fld. 1/4**

AD-621 045 **See Fld. 13/2**

AD-621 221 **See Fld. 13/2**

AD-621 514 Div. 33/3 ,33/2 ,32/4
CFSTI Prices: HC $4.00 MF $1.00
NORTHWESTERN UNIV EVANSTON ILL
A PROLEGOMENON TO THE FORECASTING OF TRANSPORTATION DEVELOPMENT.
Final rept.,
by W. L. Garrison, and D. F. Marble. Aug 65, 138p. Contract DA44 177TC685 Proj. 1V021701A047
USAAVLABS , TR-65-35
Unclassified report

Descriptors: (*Transportation, Mathematical prediction), (*Economics, Transportation), Distribution (Economics), Topology, Roads, Railroads, Cargo, Handling, Commerce, Mathematical models

The analysis proceeds with a review of the problem of forecasting transportation requirements. Several idiosyncratic models are examined and their properties specified. The forecasting of transportation stocks and commodity flows is discussed. Models of the demand for transportation services are implemented with empirical data. Graph theory as an interpretative frame of reference is introduced and the analysis moves to a detailed examination of network structure. Inter- and intra-nation network structures are compared. Codified route and commodity networks are factor analyzed and fundamental structures isolated. An attempt is made to simulate the morphological characteristics of transportation networks. Simulations of the Northern Ireland railway network are undertaken using nearest neighbor methods. Finally, the problems of planning and forecasting are reviewed in the light of the foregoing analyses. Criteria and objectives are discussed. An overall evaluation of available planning and forecasting capabilities is presented. (Author)

13/7. HYDRAULIC AND PNEUMATIC EQUIPMENT

AD-620 951 **See Fld. 9/5**

AD-621 060 Div. 26/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
WHAT IS PNEUMONICS. (PNEUMATIC AUTOMATION).
26 Aug 65, 5p. Rept. no. FTD-TT-65-731
TT , 65-63945
Unclassified report

Unedited rough draft trans. of Ekonomicheskaya Gazeta (USSR) n37 (162) p13 Sep 12 1964.

Descriptors: (*Pneumatic systems, Automation), USSR

The majority of automatic operators are stated to operate on the basis of pneumatics. A 'universal system of industrial pneumo-automation elements' was created by workers from the Institute of Automation and Telemechanics and the 'Tizpribor' factory. Devices made such universal elements are characterized by high technological efficiency and adaptation to automation. At first these devices operated only with the aid of mechanically moving parts, causing them to be slow in action, but later the pneumonic devices of the Institute of Automation and Telemechanics had their speed increased a thousand times. The operational dependability of the devices is practically unlimited; they are small and inexpensive. They perform well in an explosive or inflammable environment where electronics cannot be employed, and they are not subject to radiative emissions and vibrating loads.

AD-621 383 **See Fld. 11/6**

13/8. INDUSTRIAL PROCESSES

AD-620 820 **See Fld. 11/1**

AD-620 833 Div. 26/3 ,1/2
CFSTI Prices: HC $6.00 MF $1.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
AIRCRAFT ENGINE ASSEMBLY,
by V. N. Belikov, and A. N. Nikitin. 26 Aug 65, 291p. Rept. no. FTD-MT-65-515
TT , 65-63899
Unclassified report

Edited machine trans. of mono. Sborka Aviatsionnykh Dvigatelei, Moscow, 1964 p1-221.

Descriptors: (*Aircraft engines, Manufacturing methods), Processing, Jigs, Seals, Machine tools, USSR

The book contains information about basic types of connections used in the assembly of aircraft engines, and methods of making them. Data is presented on designing and organization of the technological process of assembly. Questions of accuracy of assembly are considered. Preparatory operations are described and examples are given of subassembly and general assembly of several types of engines. The book is a training aid for students of aviation institutes and departments. It can also present interest for engineering and technical workers of the aviation industry. (Author)

AD-620 923 **See Fld. 9/1**

AD-620 998 Div. 26/4 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF DETECTING SEPARATION AND DEFECTIVE BONDING BETWEEN THE ELEMENTS OF MULTILAYER SANDWICH STRUCTURES,
by Yu. V. Lange. 29 Jun 65, 5p. Rept. no. FTD-TT-65-222
TT , 65-63923
Unclassified report

Unedited rough draft trans. of Patent (USSR) 161 564, appl. no. 795099/25-8, 22 Sep 62.

Descriptors: (*Ultrasonic radiation, Non-destructive testing), (*Non-destructive testing, Sandwich construction), (*Sandwich construction, Non-destructive testing), (*Bonding, Non-destructive testing), USSR, Wave transmission, Propagation, Phase shift, Structures, Patents

The object of the invention is a method of detecting the separation of layers and zones of breakdown of the bonds between the elements of multilayer constructions, for example, of nonmetallic and combined metallic and nonmetallic materials, based on the use of Lamb's wave. For the purpose of eliminating the random oscillations in amplitude unavoidable in the control, the defects are revealed through the change in the speed of the propagation of the wave, a change which can be evaluated in accordance with the amount of the phase shift in the oscillations in the object between the point of origin and the point of reception which are located at a fixed distance one from the other. (Author)

AD-621 065 Div. 26/1 ,8/2
CFSTI Prices: HC $6.00 MF $1.50
NAVAL AVIONICS FACILITY INDIANAPOLIS IND
THE NAFI THIN FILM IN-LINE VACUUM DEPOSITION PROCESS AND TECHNOLOGY.
Technical publication.
1 Jul 65, 285p. Rept. no. TP-220
Unclassified report

Descriptors: (*Vapor plating, Films), (*Circuits, Microminiaturization (Electronics)), Vacuum apparatus, Silicon compounds, Monoxides, Chromium, Copper, Integrated circuits, Glass, Modules (Electronics), Cermets, Manufacturing methods

The report contains information about the materials, equipment, and processes used in a pilot line production facility designed for the fabrication of thin film microelectronic circuits. The process selected for study utilizes a concept in which passive thin film circuit elements are vaporized in a vacuum chamber and deposited on a Pyrex substrate using a through-mask technique. This process is a semi-automatic operation with a potential of becoming fully automated. The equipment consists of four in-line vacuum deposition chambers, and associated pumping systems. Controls and monitoring devices are an integral part of the semi-automatic model. Materials used for circuit element fabrication are silicon monoxide, chromium, and copper, which are evaporated singly or in combinations. Significant improvements have been made toward the goal of continuous, in-line, semi-automatic fabrication of quality-controlled thin film circuits. A limiting factor in through-mask depositions had been the high cost of mask fabrication. The use of graphite masks has made the through-mask method economically feasible for the size and density of circuits being produced at NAFI.

AD-621 074 Div. 26/4 ,30/5
CFSTI Prices: HC $6.00 MF $1.25
HUGHES AIRCRAFT CO FULLERTON CALIF GROUND SYSTEMS GROUP
ACCELERATED RELIABILITY TEST METHODS FOR MECHANICAL AND ELECTROMECHANICAL PARTS.
Final rept. for Dec 63-Jan 65,
by William Yurkowsky, and R. E. Schafer. Jul 65, 245p. Rept. no. FR-65-10-16
Contract AF30 602 3268 Proj. 5519 Task 551902
RADC , TR-65-46
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Reliability, Test methods), Statistical analysis, Electric switches, Electric relays, O-rings, Power transmission belts, Rubber, Life expectancy

The study is addressed to the development of accelerated reliability test methods for long lived mechanical and electromechanical parts. The parts studied were a subminiature snap-action switch, a crystal can relay, a mechanical seal, and a rubber timing belt. The failure times of all parts fit Weibull distributions. Failure analysis data is presented.

Several mathematical models are presented as tentative representations of the failure laws operating under conditions of combined stresses. The merits of each are investigated in relation to the data generated during this study. (Author)

AD-621 355 **See Fld. 9/1**

AD-621 549 **See Fld. 9/1**

AD-621 557 **See Fld. 11/9**

13/9. MACHINERY AND TOOLS

AD-620 976 Div. 26/5 ,32/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
FROM EXPOSITION INTO THE WORKSHOP,
by L. Kolodnii. 14 Sep 65, 8p. Rept. no. FTD-TT-65-1154
TT , 65-63917
Unclassified report

Unedited rough draft trans. of Pravda, Moscow (USSR) 8 Jan p1 1963.

Descriptors: (*Industrial equipment, USSR), Economics, Industrial production, Agriculture

AD-621 003 Div. 26/6 ,14/8
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EFFECT OF OPERATING CONDITIONS AND GAP SIZE IN THE CONNECTION OF PLASTIC AND METAL DETAILS ON THE MAGNITUDE OF THE FRICTION COEFFICIENT,
by Shen Yun-Tsyu. 26 Aug 65, 9p. Rept. no. FTD-TT-65-737
TT , 65-63928
Unclassified report

Unedited rough draft trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Mashinostroenie (USSR) n3 p82-6 1963.

Descriptors: (*Bearings, Polyamide plastics), (*Polyamide plastics, Bearings), Friction, Pressure, Lubrication, Performance (Engineering), USSR

The report discusses operational and geometric factors affecting the workability of polyamide slide bearings. The given data is useful for constructors, introducing plastics into machine construction.

AD-621 011 Div. 26/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
END SEALING OF A SHAFT,
by L. S. Arinushkin, and A. Yu. Polinovskii. 26 Aug 65, 5p. Rept. no. FTD-TT-65-773
TT , 65-63936
Unclassified report

Unedited rough draft trans. of Russian patent 134 986, pub. 23 May 60, appl. 667368/25, 2p.

Descriptors: (*Shafts, Rotary seals), (*Rotary seals, Shafts), USSR, Patents, Centrifugal fields, Springs, Hermetic seals, Gaskets

The object of the invention is the end sealing of a shaft in the form of a ring turning together with the shaft, the ring sliding on the smooth motionless end surface to which it is pressed by a spring, bellows-type packing, and slotted centrifugal packing, formed by the ring gap between the bottom of a cup turning together with the shaft and the motionless end surface. For the purpose of releasing the sliding sealing at high angular velocity the jacket of the sliding ring has a conical end surface resting on balls which push it out under the action of centrifugal force. (Author)

AD-621 307 Div. 26/5
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
PRESSURE PEAKS AT THE ENDS OF PLANE STRAIN RIGID DIE CONTRACTS (ELASTIC),
by J. N. Goodier, and C. B. Loutzenheiser. 27 Nov 64, 2p. Contract Nonr22529
Unclassified report

Pub. in Journal of Applied Mechanics Design Data and Methods Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Dies, Design), Pressure, Elasticity, Strain (Mechanics), Mathematical analysis

When a hard cylindrical roller bears over its whole length on a more extensive surface, the ends tend to damage the surface. The pressure distribution is not uniform along the length of the contact. Pressure peaks occur close to the ends. The same thing may occur, of course, in any similar band contact. This paper offers simple formulas, for guidance in design, to avoid excessive end pressure by a slight rounding off at the ends.

13/10. MARINE ENGINEERING

AD-620 869 Div. 31/5
CFSTI Prices: HC $3.00 MF $0.75
OCEANICS INC PLAINVIEW N Y
THEORETICAL STUDY OF THE MOTIONS OF AN AIRCRAFT CARRIER AT SEA.
Rept. for 1 Apr 63-30 Mar 64,
by Paul Kaplan, and Theodore P. Sargent. Jan 65, 87p. Rept. no. 65-22
Contract Nonr418600 Proj. RR011 05 04
Unclassified report

Descriptors: (*Aircraft carriers, Motion), Mathematical models, Ocean waves, Pitch (Motion), Roll, Carrier landings, Stability, Ship hulls

A mathematical model is developed for representing the heave, pitch and roll motions of an aircraft carrier at sea. The data is in the form of transfer functions relative to the waves, which are determined for a range of forward speeds and headings considered appropriate to carrier operations during the landing phase. From this information, spectral responses representing the statistical characteristics of motions in certain specific sea states are then developed. The results are presented in a form that can be applied to computer simulation studies for various types of wave disturbances, such as storm conditions, swells, and combinations of such wave systems. The motions of heave and pitch are emphasized, since roll motions are sufficiently small so that they do not significantly influence the aircraft landing operation. Certain limited conclusions as to motion severity and methods for reducing ship motions are outlined, together with recommendations for specific applications and extensions of the theoretical results. (Author)

AD-620 911 **See Fld. 9/2**

AD-620 929 Div. 31/5 ,9/4
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
NUMERICAL RESULTS FROM THE NOTS LIFTINGSURFACE PROPELLER DESIGN METHOD.
Rept. for Aug 63-Apr 65,
by D. M. Nelson. Aug 65, 56p. Rept. no. OTS-TP-3856
Task R360FR106 2161R0110101 ,RRRE04001 216 1R009 01 01
NAVWEPS , 8772
Unclassified report

See also AD-430 928.

Descriptors: (*Propellers (Marine), Design), Lift, Surface properties, Numerical analysis, Computers, Wake, Boundary layer

Numerical results from the NOTS lifting-surface propeller design programs are presented. Comparisons of computer solutions with exact analytical solutions are given and indicate that the accuracy of the computer solutions is more than adequate for engineering calculations. Design calculations for a typical wakeadapted propeller are shown. These calculations point out the importance of correctly representing the radial variation of x tan beta for a wake-adapted propeller. A discussion is also given of the work presently under way, which will include the effect of the hub boundary condition on lifting-surface propeller design. (Author)

AD-621 339 **See Fld. 15/3**

AD-621 381 **See Fld. 9/3**

AD-621 492 **See Fld. 11/6**

AD-621 564 **See Fld. 8/10**

13/10.1 SUBMARINE ENGINEERING

AD-620 918 **See Fld. 11/3**

AD-621 533 Div. 31/4 ,25/6
CFSTI Prices: HC $3.00 MF $0.75
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
PHOTOELASTIC INVESTIGATION OF LMSC RESEARCH SUBMARINE HULL.
Technical rept. on Solid Mechanics,
by A. R. Hunter. Aug 65, 84p. Rept. no. 6-65-65-20
Unclassified report

Descriptors: (*Submarine hulls, Model tests), Test methods, Photoelasticity, Hemispherical shells, Stresses, Structures, Mathematical analysis, Joints, Spheres, Hatches, Pressure

The proposed bi-spherical pressure hull design to be used in the LMSC submarine was evaluated utilizing the three-dimensional 'frozen' stress photoelastic technique. This evaluation was made using two plastic models, a bi-spherical hull model and a spherical shell model with hatch configurations. The models were subjected to external pressure loading and a programmed thermal cycle to freeze photoelastic stress patterns into the models. The models were then sliced, and stress distributions determined by photoelastic analysis of the slices. The photoelastic results indicated the higher bending stresses in the models than predicted by an analytical solution. The differences between analytical and photoelastic results were attributed to imperfect model geometry. Therefore, attention should be given to geometric parameters in the fabrication of the full scale submarine hull.

AD-621 567 **See Fld. 11/6**

13/12. SAFETY ENGINEERING

AD-620 899 Div. 13/11,10/7 ,1/5
CFSTI Prices: HC $1.00 MF $0.50
BUREAU OF MINES PITTSBURGH PA
FIRE AND EXPLOSION HAZARDS OF FLIGHT VEHICLE COMBUSTIBLES.
Quarterly progress rept. for 1 Jun-31 Aug 65,
by J. M. Kuchta, G. H. Martindill, and I. Spolan. 31 Aug 65, 7p. Contract AF33 615 64 1007 Proj. 8119 Task 811934
Unclassified report

See also AD-614 694.

Descriptors: (*Halogenated hydrocarbons Fire extinguishers), (*Fire extinguishers, Aerospace craft), (*Titanium, Flammability), Autoignition, Test equipment, Explosions, Hazards, Ignition, Fire safely

The study was initiated to determine the ignition and flammability characteristics of titanium and its alloys in air and with various halogenated hydrocarbon fire extinguishing agents. The following fire extinguishing materials are included: bromochloromethan - CH2BrC1. dibromodifluoromethane - CBr2F2, bromotrifluoromethane - CBrF3,1,1,1,-trifluorobromochloroethane - CF3CHBrC1,1,2,2-trifluoropentachloropropane - CC13CF2CFC12. Various halogenated hydrocarbon materials are known to be effective as fire extinguishing agents and are employed in current aircraft fire protection systems. The utilization of similar type agents is being considered for fire protection in advanced flight vehicles which make extensive use of titanium and its alloys. During the present report period, a literature search was conducted, necessary materials were acquired for the initial experimental work, and test apparatuses were assembled and calibrated. In addition, ignition temperature type experiments were initiated with the fire extinguishing materials (vapors) in contact with heated titanium metal in air, nitrogen, and argon atmospheres. For convenience, the present experimental work is divided into two phases: (1) Autoignition experiments in heated vessels. (2) Experiments with electrically heated wires. (Author)

AD-620 940 Div. 13/11,10/5 ,30/3
CFSTI Prices: HC $4.00 MF $0.75
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
DETECTION OF LIQUID CRYSTAL GASES (REACTIVE MATERIALS).
Final rept. for 1 Feb-12 Nov 64,
by J. L. Fergason, N. N. Goldberg, C. H. Jones, R. S. Rush, and L. C. Scala. Aug 65, 125p. Contract AF30 603 3306 Proj. 5534 Task 553402
RADC , TR-64-569

Unclassified report

Descriptors: (*Air pollution, Gas detectors), (*Gas detectors, Crystals), Fatty acid esters, Cholesteryl esters, Gases, Hydrochloric acid, Hydrogen compounds, Fluorides, Hydrazine, Dimethyl hydrazine (1-1), Nitrogen compounds, Dioxides, Vapors, Colors, Rocket propellants

A set of reactive liquid crystal materials were developed which are capable of detecting quantities (10 ppm or less) of HCl, HF, hydrazine, UDMH, and nitrogen dioxide. The materials exhibit a change in color transition temperature upon exposure to these contaminant gases or vapors. Except for HF and HCl, the contaminants are readily distinguished from each other. (Author)

13/13. STRUCTURAL ENGINEERING

AD-620 816 Div. 13/4 ,17/6
CFSTI Prices: HC $7.00 MF $1.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
BUILDING STRUCTURES FROM ALUMINUM ALLOYS (COLLECTION OF ARTICLES),
by S. V. Taranovskii. 27 Jul 65, 388p. Rept. no. FTD-MT-64-156
TT , 65-63859

Unclassified report

Edited machine trans. of mono. Stroitelnye Konstruktsii iz Alyuminievykh Splavov, Moscow, 1962 p1-339.

Descriptors: (*Structural parts, Aluminum alloys), (*Aluminum alloys, Structural parts), Structures, Buildings, Mechanical properties, Corrosion, Rods, Loading (Mechanics), Riveted joints, Beams (Structural), Panels (Structural), Costs, USSR

Contents: Basic problems in preparation for broad application of aluminum alloys in construction, Contemporary aluminum alloys, Aluminum alloys in civil construction, Investigation of physico-mechanical properties of aluminum alloys D1-T, D16-T, AMg61, and D16-A (g/k), Investigation of mechanical properties of certain aluminum alloys under tension and compression, Corrosion resistance of aluminum alloys in building structures, Basis of certain methods of calculation of strength in SN113-60 (Building Standards), Experimental investigation of local strength of angular profiles from alloy D16-T, Experimental-theoretical investigations of centrally-compressed rods from aluminum alloys, Load-bearing ability of eccentrically compressed rods from aluminum alloy AV-T1, Cold riveting of bridge and other building structures from aluminum alloys, Nodal joints of tubular aluminum trusses, On vibration strength of riveted joints from Duralumin and aluminum-magnesium alloy AMg61, Investigation of work of compound I-Beams from aluminum alloys, Assortment of general-usage profiles from aluminum alloys, Designing of certain types of roof and wall panels with application of bent profiles, Designing and manufacture of building structures and articles from aluminum alloys, Experience of designing of structures from aluminum alloys, Designing of first highway bridge in USSR with aluminum span structure, Prestress of open trusses from aluminum alloys for industrial buildings, On question of determination of cost of pressed profiles for building parts.

AD-620 874 Div. 13/4 ,9/4
CFSTI Prices: HC $2.00 MF $0.50
ARMY COASTAL ENGINEERING RESEARCH CENTER WASHINGTON D C
THE STATISTICAL DISTRIBUTION OF OCEAN WAVE FORCES ON VERTICAL PILING.
Technical memo.,
by Leon E. Borgman. Jul 65, 34p. Rept. no. TM-13

Unclassified report

Descriptors: (*Foundations (Structures), Hydrodynamics), (*Ocean waves, Hydrodynamics), (*Piers, Hydrodynamics), (*Hydrodynamics, Foundations (Structures)), Statistical distributions, Load distribution, Force (Mechanics), Statistical analysis, Civil engineering, Harbors

Theoretical distribution and relationships concerning wave forces on piling for unidirectional waves of very small amplitude having narrow-band spectrum are investigated mathematically and compared with measured data for finite waves with an almost narrow-band spectrum. The usual force formula consisting of a drag and an inertial component, each multiplied by coefficients supposedly constant, are used. A graphical method is presented for estimating parameters defining these forces which permits replacing the distribution of the measured forces with an empirical distribution function adjusted for the condition that only those waves with forces exceeding some significant peak value are included in the measured data. (Author)

AD-620 893 **See Fld. 15/3**

AD-620 894 **See Fld. 15/3**

AD-620 955 **See Fld. 11/7**

AD-620 958 Div. 13/4 ,30/3
CFSTI Prices: HC $3.00 MF $0.75
BUREAU OF RECLAMATION DENVER COLO SOILS ENGINEERING BRANCH
LABORATORY TESTS TO REFINE THE MAXIMUM DENSITY PROCEDURE FOR COHESIONLESS SOILS USING A VIBRATORY TABLE,
by J. Hardin. 25 Mar 65, 70p. Rept. no. EM-697

Unclassified report

Descriptors: (*Soil mechanics, Laboratory equipment), (*Vibrators (Mechanical), Soil mechanics), Soils, Density, Vibration, Sand, Gravel

To improve the test procedure for determining the maximum laboratory dry density of cohesionless coils, time of vibration, initial dry density, amplitude and frequency of vibration, and the moisture condition of the material were investigated. Changes in the gradation during vibration increased both the minimum and maximum dry densities of a weakly-cemented dune sand. The increase in density was insignificant for times of vibration greater than 6 minutes except for the weakly-cemented material. The initial density of the soil prior to vibration did not have a significant effect on the final density. No conclusions could be drawn as to the effect of the amplitude and frequency of vibration on the dry density from the results using two electromagnetic vibrators and one eccentric weight vibrator. The difference between the densities obtained using ovendried soil and initially saturated soil was not significant for the two soils tested: a poorly graded sand and gravel, 3-inch maximum-size, and a poorly graded fine sand. The results did not suggest any revisions which would improve the Bureau's current method for determining the maximum laboratory density of cohesionless soils. (Author)

AD-620 993 Div. 13/4 ,25/6
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THERMAL STRESSES IN STRUCTURAL ELEMENTS. REPORTS OF SCIENTIFIC CONFERENCE,
by A. D. Kovalenko. 2 Sep 65, 261p. Rept. no. FTD-MT-64-350
TT , 65-63918

Unclassified report

Repts. of Conference held at Kiev, Jun 62. Edited machine trans. of mono. Teplovye Napryazheniya v Elementakh Konstruktsii. Doklady Nauchnogo Soveshchaniya (no. 3), Kiev, 1963 p1-224. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Structural parts, Thermal stresses), (*Gas turbines, Thermal properties), Symposia, Structural properties, Strength, Plasticity, Thermal conductivity, Turbine blades, Structural shells, Thermodynamics, Creep, Structural shells, Mathematical analysis

Collection contains reports of scientific conference of thermal stresses in structural elements conducted by scientific council on the problem 'Scientific bases of strength and plasticity' at OTN Academy of Sciences of USSR, by Kiev Order of Lenin State University im. T. G. Shevchenko, and by Institute of Mechanics of Academy of Sciences USSR. Reports are dedicated to research of nonstationary problems of thermal conductivity, problems of thermoelasticity and thermoplasticity and thermoplasticity in quasi-static setting: to study of thermal stresses in separate elements of structures; and to consideration of dynamic effects during heating. Illuminated also are questions of stability of shells during nonuniform heating, calculations of plastic flows in structures during multiple nonuniform heating and other questions of thermal strength of structures. (Author)

AD-621 042 Div. 13/4
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
MECHANICAL PROPERTIES OF SEA ICE WITH REFERENCE TO STRUCTURAL BEHAVIOR OF ICE SHEETS.
Technical note,
by K. S. Pister. Aug 65, 20p. Rept. no. TN-N-758
Proj. Y F015 11 01 052

Unclassified report

Descriptors: (*Civil engineering, Ice islands), (*Ice islands, Mechanical properties), Structural properties, Ice, Seawater, Trafficability, Environmental tests, Theory

A phenomenological approach must be followed in studying the mechanical behavior of sea ice. The material should be first studied at the level of the solid continuum before considering the behavioral contributions from defects and impurities in the structure as well as grain boundary interference. Experimental evidence suggests that the mechanical behavior of sea ice is quite similar to other solids at near-melting temperature. A reasonable starting point for developing constitutive equations for the mechanical behavior of sea ice would be the fundamental theories advanced in the research of metals at elevated temperatures. In some areas, the advanced theory appears to be adaptable to the study of mechanical behavior of sea ice, while in others, constitutive equations will have to be developed. Emphasis is needed in researching the problems of short-term behavior, long-time creep and parametric effects of temperature, age and brine content on strength, as well as repeated loading and cumulative damage. A major effort is needed to develop basic data on behavior of sea ice in simple bending and bending under 2- and possibly 3-dimensional states of stress. This includes investigation of mechanical behavior of small beams, model ice sheets, and the in situ condition. (Author)

AD-621 045 See Fld. 13/2

AD-621 145 Div. 13/4
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING
BEHAVIOR OF FLEXIBLE UNDERGROUND CYLINDERS.
Technical rept. for 1 Mar 64-2 Apr 65,
by Ulrich Luscher. Sep 65, 73p. Contract AF29 601 6368 Proj. 5710
AFWL , TR-65-99

Unclassified report

Descriptors: (*Underground structures, Mechanical properties), (*Cylindrical bodies, Flexible structures), (*Pipes, Underground structures), Deformation, Buckling (Mechanics), Loading (Mechanics), Soil mechanics, Failure (Mechanics), Elasticity

An investigation was made of the 'elastic' behavior and failure condition of underground flexible cylinders with particular attention given to arching, deformation and buckling. The report presents no new data, rather draws heavily from experimental and theoretical work done in the past several years in an attempt to arrive at a unified picture of the chosen aspects of behavior. Active arching was found to reduce the load acting on tubes buried at depths up to several diameters in stiff soil by an average of 30 percent. On the other hand, passive arching may subject tubes buried in compressible soil to loads somewhat higher than applied on the surface. Spangler's deformation equation was modified to account for arching, lateral pressures, and variability of the soil modulus with pressure. Values of the modified modulus of passive soil resistance, backcalculated by the new equation from tube deformation data, were successfully related to the constrained modulus of the soil. A comprehensive theory of buckling of underground cylinders is presented. (Author)

AD-621 178 See Fld. 4/2

AD-621 249 Div. 13/4 ,13/3
CFSTI Prices: HC $2.00 MF $0.50
BUREAU OF RECLAMATION DENVER COLO CONCRETE AND STRUCTURAL BRANCH
CONCRETE INVESTIGATIONS FOR MORROW POINT DAM AND POWERPLANT, CURECANTI UNIT COLORADO RIVER STORAGE PROJECT,
by J. J. Straughan. 16 Aug 65, 47p. Rept. no. C-1053A ,C-1053 superseded

Unclassified report

Descriptors: (*Concrete, Physical properties), (*Dams, Concrete), Design, Specifications, Power plants (Establishments), Colorado, Sand, Compressive properties, Thermal properties, Permeability, Freezing, Mixtures, Rivers

The Morrow Point Dam and Powerplant concrete investigations indicate that project materials will produce concretes which will meet design and service requirements for mass and structural concretes. The study started in March 1962 investigated the relative quality of aggregates and the structural and mass concrete made with selected project materials. Conclusions were: (1) Optimum sand contents for structural concretes were 42, 34, and 28 for concrete with 3/4-, 1-1/2-, and 3-inch maximum-size aggregate, respectively. Mass concrete with 6-inch maximum-size aggregate required about 20 percent sand for adequate workability. (2) Significant cement savings were achieved through the use of a water-reducing agent. (3) Compressive strength tests showed that structural and mass concretes met design requirements. (4) Elasticity modulus ranged from 4.48 to 5.21 million psi. (5) Freeze-thaw durability is considered excellent. (6) Permeability is excellent. (7) Temperature rise is about average for mass concrete containing 4 sacks of cement. Thermal conductivity, coefficient of expansion, and diffusivity were lower than average. (8) Drying shrinkage values were higher than average. Specimens fog-cured showed greatest shrinkage. (Author)

AD-621 340 Div. 13/4 ,25/6
ARMY ENGINEER WATERWAYS EXPERIMENT STATION VICKSBURG MISS
RESPONSE OF HORIZONTALLY ORIENTED BURIED CYLINDERS TO STATIC AND DYNAMIC LOADING.
Final technical rept. for Feb 64-May 65,
by Albert F. Dorris. Jul 65, 222p. Rept. no. TR-1-682

Unclassified report

Available from Army Engineer Waterways Experiment Station, Vicksburg, Miss. HC $3.00. Available from CFSTI MF $1.25.

Descriptors: (*Civil engineering, Underground structures), (*Cylindrical bodies, Compressive properties), (*Underground structures, Loading (Mechanics)), (*Loading (Mechanics), Cylindrical bodies), Sand, Clay, Soil mechanics, Structures, Statics, Dynamics, Load distribution, Failure (Mechanics), Shelters

This was an experimental investigation into the response of small, shallow-buried (in dense, dry sand and stiff clay), aluminum cylinders to static (15-min rise time), rapid (13 msec), and dynamic (0.3 msec) plane-wave loading up to 500 psi. The cylinders had identical outside diameters of 3.5 in. and two thicknesses, 0.022 and 0.065 in. Hence, the cylinder stiffnesses, EI/CuR, were 1.7 and 45 (d/t = 159 and 54), respectively. In stiff clay, the overpressure required to cause collapse increased very slowly with increasing depth of burial from zero to the deepest burial, three-quarters of the diameter. The hydrostatic buckling equation, Pcr = 3 EI/CuR, was applicable for the cylinders tested. In the dense sand, the overpressure required to cause collapse increased greatly with increasing depth of burial from zero to one-eighth of the diameter. Below this depth it was not possible to collapse even the most flexible cylinders under the available 500-psi pressure. The hoop compression theory was verified. A ductility factor of about 7 was found to be conservative for cylinders buried at depths greater than one-eighth their diameter in the dense sand. The recorded strains were nonelastic in amny cases and it was shown that large yielding does not necessarily define collapse. Stress and moment were found to be nonlinear functions of overpressure, whereas thrust was generally found to be a linear function of overpressure. The differences between static and rapid loading in the elastic response of the cylinder were found to be small. (Author)

AD-621 363 See Fld. 8/11

AD-621 377 Div. 13/4 ,18/1
CFSTI Prices: HC $3.00 MF $0.75
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
THERMAL TRANSIENT RESPONSE OF UNDERGROUND SHELTERS.
Technical note,
by D. F. Sampsell. 18 Aug 65, 68p. Rept. no. TN-711
Proj. Y F011 05 02 341

Unclassified report

Descriptors: (*Underground structures, Shelters), (*Shelters, Temperature control), Thermal conductivity, Thermal properties, Models (Simulations), Analog computers, Controlled atmospheres, Climatology, Soils, Ventillation, Mathematical models, Equations

The sound design of environmental control systems for underground shelters is based on knowledge of the thermal transient response under certain climatic conditions. To gain insight into the transient response of underground shelters, a series of tests using a scale model shelter was conducted. Model-prototype considerations resulted in several model temperature distortions which could be accounted for by analytical techniques. The corrected model results agreed well with results from an analog computer study which considered the same prototype shelter. The model results also indicated that shelter shape does not significantly affect its transient response. Another phase of this study was the development of a non-computer design procedure for determining the environmental control system capacity required for a given set of climatic and soil conditions. The design procedure was applied to a number of shelter locations and climatic conditions to test its performance. As expected, the solutions indicated that ventilation rate and air-conditioning capacity depend heavily on climate, initial soil temperature, and shelter area per person. This report is intended as a record of the analytical and experimental methods evolved under the task to date. All analytical and experimental techniques are described in detail, and numerical examples for a typical model run and design procedure solution are given. Further refinement and application of the model study techniques and non-computer design procedure are presently underway, and it is hoped that this work will lead to recommended design data. (Author)

AD-621 553 See Fld. 20/12

AD-621 580 Div. 13/4
CFSTI Prices: HC $3.00 MF $0.75
BROWN UNIV PROVIDENCE R I DIV OF ENGINEERING
MODE APPROXIMATIONS FOR IMPULSIVELY LOADED RIGID PLASTIC STRUCTURES,
by J. B. Martin, and P. S. Symonds. May 65, 60p. Rept. no. BU/DTMB/6
Contract N189 181 57827Ax

Unclassified report

Descriptors: (*Structures, Loading (Mechanics)), (*Loading (Mechanics), Structures), (*Civil engineering, Loading (Mechanics)), Metals, Ductility, Plasticity, Elasticity, Deformation, Dynamics, Theory

An attempt is made to provide a rational method of constructing one degree of freedom approximations for impulsively loaded metal structures which are analysed according to an elementary rigid-plastic theory. The approximation follows automatically from a chosen mode shape, and a criterion for determining good mode shapes is introduced. (Author)

14/2. LABORATORIES, TEST FACILITIES, AND TEST EQUIPMENT

AD-620 827 Div. 30/6
CFSTI Prices: HC $3.00 MF $0.75

AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

INVISCID VELOCITY PROFILE PRODUCED BY AN AXISYMMETRIC CONTOURED NOZZLE FOR AN ARCHEATED HYPERSONIC WIND TUNNEL.

Master's thesis,
by Thomas Laurence Larsen. Jun 65, 81p. Rept. no. GAM-65B/ME/65-5

Unclassified report

Descriptors: (*Hypersonic nozzles, Hypersonic wind tunnels), Geometric forms, Design, Nonequilibrium flow, Axially symmetric flow, Aerodynamic heating, Electric arcs, Velocity, Diffusers, Enthalpy, Instrumentation

The study experimentally investigated equilibrium and non-equilibrium flow at the exit of a 9 1/2 inch diameter axisymmetric contoured hypersonic nozzle. The flow was probed with an impact pressure probe, and steady state and transient calorimeters, and the velocity was calculated from these data. The shape of the resulting velocity profiles showed that the nozzle produced uniform parallel flow, and that the nozzle design method was adequate for use in designing a 5.5 foot diameter contoured nozzle to produce equilibrium flow up to Mach 10 and non-equilibrium flow at Mach numbers of 11-15 in an arc-heated hypersonic tunnel. (Author)

AD-620 838 See Fld. 20/13

AD-620 860 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

HIGH-TEMPERATURE TESTING DEVICE FOR DETERMINING THE DEFORMATION OF HEAT-RESISTANT MATERIALS AND THEIR TEMPERATURE,

by E. M. Bulysov, and R. Ya. Drozdov. 13 Aug 65, 5p. Rept. no. FTD-TT-65-638
TT , 65-63880

Unclassified report

Unedited rough draft trans. of Russian Patent 165 562, pub. 25 Apr 63, appl. 833061/25-8, 1p.

Descriptors: (*Heat-resistant materials, Extensometers), (*Extensometers, Heat-resistant materials), (*Deformation, Heat-resistant materials), USSR, Patents, Hightemperature research, Test equipment

The object of the invention is a high temperature testing device for determining the deformation of heat-resistant materials and their temperatures consisting of a water cooled cylinder provided with a slotted type graphite heater and a vacuum pump. For the purpose of determining the different structural changes in the material on heating, a calibrating specimen with a known coefficient of expansion is used which is made up in such a way that through it the edges of the tested specimen, placed together in one plane with the edges of the calibrating specimen, are observed.

AD-620 883 See Fld. 22

AD-620 924 Div. 30/3
WESLEYAN UNIV MIDDLETOWN CONN DEPT OF PHYSICS

USE OF A WATER ASPIRATOR IN CONJUNCTION WITH SORPTION PUMPING ON AN ULTRAHIGH VACUUM SYSTEM,

by Allan M. Russell. 26 Feb 65, 2p. Contract Nonr467601 Proj. NR017 441

Unclassified report

Pub. in Review of Scientific Instruments v36 n6 p854 Jun 1965 (Copies not available to DDC or Clearinghouse).

Descriptors: (*Vacuum apparatus, Sorption), (*Laboratory equipment, Vacuum apparatus), Water, Separation, Vacuum pumps, Field emission, Spectrum analyzers

A water aspirator with sorption and ion pumping in a stainless steel system was devised for achieving an ultrahigh vacuum environment for a field emission spectrometer tube. The system is initially evacuated to a pressure of about 100 Torr with a water aspirator. The line from the aspirator is trapped with liquid nitrogen to prevent accumulation of H2O vapor. The initial pumping takes 1 to 2 min after which 2 valves are closed. The sorption pump is then cooled with liquid N for 10 min, one of the valves is opened, and the pressure is reduced to 0.005 Torr in about 10 min. The ion pump is then started, and two other valves are closed. As the sorption pump warms to room temperature, its pressure will remain below atmospheric pressure and 2 gages can be observed to assure that there will be little risk of blowing the molecular sieve into the rest of the vacuum system when one of the last valves is opened.

AD-620 940 See Fld. 13/12

AD-620 941 See Fld. 17/2

AD-620 958 See Fld. 13/13

AD-620 969 Div. 30/5 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

ROTATIONAL ELASTOVISCOSIMETERS FOR STUDYING POLYMERIC SYSTEMS,

by G. V. Vinogradov, and I. M. Belkin. 28 May 65, 12p. Rept. no. FTD-TT-65-144
TT , 65-63910

Unclassified report

Unedited rough draft trans. of Zavodskaya Laboratoriya (USSR) v30 n3 p364-7 1964.

Descriptors: (*Viscosimeters, USSR), Rotation, Viscosity, Viscoelasticity, Elasticity, Measurement

Rotational viscosimeters of the cone-plane type are described wherein the material under investigation is placed in a gap between the working surfaces, i.e. a rotating plane and a stationary cone. Elastoviscosimeters of the cone-plane type are intended for such rheological investigations as the measurement of viscous and elastic properties of polymeric systems. The rotational viscometer REV-1 is described that is intended for studying highly viscous media, in the range from -30 to 300 degrees C, in air, in vacuum (to about 0.001 mm Hg) and in an inert gas. The material being investigated is loaded into the device in the form of cone-shaped tablets (about 5g); the error in measuring torque does not exceed 1% and in measuring viscosity, 4.5%. The REV-1 may be modified to measure elasticity wherein the origination of stress is normal to the plane of displacement; the modification uses 2 conical surfaces and permits lower rates of deformation than the coneplane system. The rotational elastoviscometer REV-2 operates similarly to the REV-1. The value of viscosity on these and other devices differed by no more than 6%.

AD-620 971 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

METHOD OF DETERMINING THE SPEED OF A GAS FLOW,

by E. V. Zarubin. 17 Jun 65, 5p. Rept. no. FTD-TT-65-197
TT , 65-63912

Unclassified report

Unedited rough draft trans. of Russian patent 163 444, pub. 29 Jul 63, appl. 850195/26-10, 2p.

Descriptors: (*Flowmeters, Gas flow), (*Gas flow, Velocity), Electric discharges, Oscillation, Frequency, USSR, Patents, Measuring devices (Electrical+electronic)

The object of the invention is a method of determining the speed of a gas flow through the creation of an HF electrical discharge perpendicular to its direction. For the purpose of linearization of the dependence of the output signal on the measurable value, and also the simplification of its distance transmission, the speed is determined in accordance with the frequency of the oscillations of the power in the spark discharge. (Author)

AD-620 995 See Fld. 20/12

AD-620 996 See Fld. 4/2

AD-621 016 Div. 30/3 ,27/3
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

DESIGN AND TEST OF A DEVICE FOR THREE DIMENSIONAL NOZZLE THRUST MEASUREMENT.

Master's thesis,
by John Bernard Catiller. Jun 65, 90p. Rept. no. GAM-65B/ME/65-1

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Thrust, Measurement), (*Test equipment, Rocket motor nozzles), Gas flow, Calibration, Design, Three-dimensional flow, Diffusers, Hydraulic systems

An omnidirectional thrust measuring apparatus was designed, built and tested. Its function is to test unsymmetrical air flowing devices. The apparatus uses the laboratory compressed air system as a supply source. It consists of a large, vertically suspended, freely pivoting, stagnation chamber, with a nozzle mounting plate which can move within the chamber. Movement is restricted by hydraulic systems, and thrust is determined from the hydraulic system's pressures. The system is capable of measuring radial thrust from 0.1 to 50 pounds in any direction and axial force from 3 to 900 pounds, as presently equipped. (Author)

AD-621 019 Div. 30/4 ,27/3
CFSTI Prices: HC $4.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

A DESIGN OF A PROPULSION RESEARCH LABORATORY.

Master's thesis,
by Douglas A. Fretts. Jun 65, 150p. Rept. no. GAW/ME/65-1

Unclassified report

Descriptors: (*Rocket laboratories, Design), Rocket propulsion, Rocket research, Instrumentation, Control system, Recording systems, Transducers

The report describes in detail a system design for a propulsion research laboratory intended to support graduate studies at the Air Force Institute of Technology. The system supports experimental rocket motors up to 500 pounds thrust. Major design considerations were the state-of-the-art, flexibility, safety, and low direct cost. A gaseous propellant system employs two stages of pressure regulation and sonic venturi flow metering. The completely electrical control system uses a flow chart control console layout and features a manually stepped control sequencer and an analog computing circuit for the real time calculation and display of propellant mass flow rates. The measurement instrumentation achieves maximum flexibility by means of a patch panel for the selection of transducers, signal conditioning circuits and oscillograph recorder channels. The signal conditioning system has been designed for local fabrication at relatively

low cost and includes manually operated multistep calibration circuits. The report includes in its appendices recommended implementation schedule, system safety considerations, a tentative operating procedure, and a visit report made in support of this design. (Author)

AD-621 024 Div. 30/6 ,9/7
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
AN EXPERIMENTAL STUDY OF BOUNDARY LAYER PARAMETERS AT THE EXIT OF A HYPERSONIC CONTOURED NOZZLE.
Master's thesis,
by James Daryl Cox. Jun 65, 72p. Rept. no. GAM-65B/ME/65-2

Unclassified report

Descriptors: (*Hypersonic nozzles, Boundary layer), (*Wind tunnel nozzles, Boundary layer), Hypersonic flight, Turbulent boundary layer, Design, Electric arcs, Heaters, Thickness, Enthalpy, Heat exchangers, Diffusers

The boundary layer thickness and displacement thickness were experimentally evaluated at the exit plane of an arc heated 9.492 inch exit diameter hypervelocity (M> or =8) contoured nozzle for both equilibrium and nonequilibrium flows. It was concluded that the boundary layers were turbulent and the use of a plenum chamber decreases the displacement thickness for identical arc heater stagnation chamber conditions. (Author)

AD-621 027 Div. 30/4 ,9/1
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A STUDY OF A SUPERSONIC EJECTOR MIXING CHAMBER.
Master's thesis,
by George Einar Strand. Jun 65, 82p. Rept. no. GAM 65B/ME/65-8

Unclassified report

Descriptors: (*Jet pumps, Supersonic flow), Jet mixing flow, Turbulence, Design, Nozzles

An experimental investigation was performed to study the characteristics of the flow in a two-dimensional air ejector in which the center stream entered the mixing chamber at a Mach number of 1.90 while the velocity of the secondary flow was varied from zero to Mach 0.7. Mass flow ratios of the ejector were approximately equal when the pressures of the two streams were equal at the entrance to the mixing chamber. The chamber had a rectangular cross section and converged slightly; its length was equal to 16 times the width. Pressures measured at the walls and the centerline of the flow indicated that a maximum static pressure was reached at 8 widths of the chamber downstream of the nozzle when the flow was completely expanded at the nozzle exit. The maximum static pressure was achieved in less distance for the overexpanded condition and took longer for the underexpanded condition. The flow was always subsonic by the time the maximum pressure position was reached except in the underexpanded case, where the flow remained supersonic throughout the chamber and the maximum pressure was located at the exit to the chamber. (Author)

AD-621 030 Div. 30/3 ,25/3 ,2/7
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
AN EXPERIMENTAL STUDY OF AN ELECTROSTATIC PRECIPITATOR USED FOR THE COLLECTION AND SIZING OF AIRBORNE PARTICULATE MATTER.
Master's thesis,
by Russell F. Mitchell. Aug 65, 97p. Rept. no. GNE/Phys/65-13

Unclassified report

Descriptors: (*Electrostatic precipitation, Particles), (*Particles, Airborne), Particle size, Collecting methods, Mathematical models, Programming (Computers), Physical properties, Ceramic materials, Phosphorescent materials, Inorganic compounds, Spheres, Tungsten, Theory, Dielectric properties, Density

An experimental investigation to determine the feasibility of using an electrostatic precipitator for sizing airborne micron size particles has been completed. Samples of particles with known radii and physical properties were injected into the precipitator under controlled conditions. The resulting deposition patterns were measured and checked against a mathematical model previously developed at the Air Force Institute of Technology (D. L. Lamberson. A study of the electrostatic precipitation of radioactive aerosols. M.S. Thesis, 1961) but modified by the author. The point at which particles were collected was found to be extremely sensitive to physical properties of the particles sampled so that an electrostatic precipitator could not separate particles into size fractions unless the particles sampled had the same physical properties. (Author)

AD-621 062 See Fld. 6/12

AD-621 072 Div. 30/5 ,30/3 ,14/5
CFSTI Prices: HC $3.00 MF $0.75
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
LUBRICATION RESEARCH AND TEST METHOD DEVELOPMENT FOR AEROSPACE PROPULSION SYSTEMS.
Rept. for 15 Feb 64-15 Apr 65,
by B. B. Baber, W. R. Blackstone, and P. M. Ku. Aug 65, 71p. Contract AF33 657 11088 Proj. 3044 Task 304402
APL , TR-65-70

Unclassified report

Descriptors: (*Lubricants, Test methods), (*Impact shock, Lubricants), Aerospace craft, Propulsion systems, Aluminum, Test equipment, Greases, Oxidizers, Drop testing

This program was concerned with the further development of the ABMA impact tester and the investigation of different test methods used to determine the impact sensitivity of materials in contact with rocket propellants. It was found that the specimen cup material and design had a significant effect on plummet rebound height. The use of a modified anvil region assembly, including a steel specimen cup, significantly increased the reactivity of materials subjected to impact in the presence of LOX in addition to improving plummet rebound height repeatability. The 'up-and-down' test procedure, from which a statistical estimate of the drop height producing a 50-percent probability of reaction may be obtained, was investigated. The results of 10 separate up-anddown tests on one grease material showed repeatability to be excellent. Results were also obtained for additional greases and these results showed that some greases rated as satisfactory had about the same 50-percent points as other greases considered unsatisfactory, with the only apparent difference being the intensity of the reactions. (Author)

AD-621 074 See Fld. 13/8

AD-621 093 Div. 30/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
A SELF-BALANCING HIGH-VOLTAGE CAPACITANCE BRIDGE,
by Oskars Petersons. 24 Jun 64, 10p. Rept. no. NRC-8487

Unclassified report

Pub. in IEEE Transactions on Instrumentation and Measurement v1M13 n4 p216-24 Dec 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Capacitance bridges, Electrical corona), (*Electrical corona, Transmission lines, Amplifiers, Feedback, Measurement, Canada

A self-balancing high-voltage capacitance ratio bridge, especially designed for continuous measurement of corona losses on experimental transmission lines, is described. The instrument is derived by combining a negative-feedback amplifier with a high-voltage capacitance bridge based on the current comparator principle. Manual control is provided for the four most significant decades of the bridge, thus permitting the function of the feedback amplifier to be limited to the balancing of small deviations. In this manner the errors originating in the amplifier and the associated indicating or recording instruments are made insignificant in the overall measurement. The accuracy of the built-in current comparator is 0.001 per cent, of the circuitry associated with the amplifier, 1 per cent. The output of the automatic balancing circuit is instrumented to produce a readout which is proportional to the power loss and reactive voltamperes. Both components are in the form of small dc voltages and thus are suitable for recording. (Author)

AD-621 094 Div. 30/3
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
A COAXIAL CALORIMETER FOR USE AS A MICROWAVE POWER STANDARD,
by Richard F. Clark. 28 Sep 64, 6p. Rept. no. NRC-8511

Unclassified report

Pub. in IEEE Transactions on Instrumentation and Measurement v1M14 n1/2 p59-63 Mar-Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Radiofrequency power, Standards), (*Calorimeters, Coaxial cables), Measurement, Thermocouples, Direct current, Voltage, Resistance (Electrical), High frequency, Attenuation, Standing wave ratios, Canada

A coaxial calorimeter has been built for use in the comparison of power at high frequencies with dc resistance and voltage standards. The temperature rise of the metal jacket of a 50-ohm coaxial termination is measured with a thermopile when a known level of dc power is fed into the calorimeter. The high-frequency sensitivity of the calorimeter is obtained by modifying the dc sensitivity for: (1) Input VSWR of the calorimeter, (2) Attenuation of a 6-inch length of thermally insulating input coaxial line, (3) The effect of current distribution in the load. The accuracy is estimated at better than =1 per cent below 4 Gc/s with the largest errors due to the input VSWR of the calorimeter. (Author)

AD-621 097 See Fld. 20

AD-621 098 See Fld. 9/1

AD-621 117 See Fld. 20/12

AD-621 137 Div. 30/3 ,15/1 ,12/2
CFSTI Prices: HC $2.00 MF $0.50
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
OPTIMUM AND QUASI-OPTIMUM CONTROL OF THIRD AND FOURTH-ORDER SYSTEMS,
by Irmgard Flugge-Lotz, and Harold A. Titus,Jr.. Jun 62, 32p. Contract AF49 638 513
AFOSR , 2928

Unclassified report

Descriptors: (*Control systems, Optimization), (*Optimization, Control systems), Linear systems, Switching circuits, Differential

equations, Matrix algebra, Satellite attitude, Fuel consumption

Pontryagin's maximum principle is used for computing the optimum control function u (t) for a given plant and a given performance criterion. If u (t) is bounded, the control is of the bang-bang type in many cases. If u (t) is expressed as the function of the state variables, that means, u (t) = sgn f (x to the ith power), the equation f (x to the ith power) = 0 determines the switching surface in the state space. In general these surfaces are not given by simple analytic functions, in particular not if the transfer function of the plant contains complex poles. If the desired final state is given by error and error derivates being zero, this surface goes through the origin of the phase space. Based on experiences with second-order plants, a systematic attempt has been made to approximate the exact switching surfaces for third-order plants. There is an approximation of the surface portion close to the origin (the so-called 'inner' surface) and an approximation of the larger portion of the switching surface which is not close to the origin (the 'outer' surface). Examples show the use of these surfaces; their results are compared to results with exactly optimum switching. They agree well. The extension to fourth-order systems is indicated. (Author)

AD-621 152 Div. 30/5 ,25/6 ,25/8
CFSTI Prices: HC $2.00 MF $0.50
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY RAPID CITY DEPT OF PHYSICS
A SYSTEM FOR LOW-TEMPERATURE MEASUREMENTS OF THERMAL CONDUCTIVITY. MEASUREMENTS ON SILICON FROM 77 TO 300K.
Technical rept. (Doctoral thesis),
by Ronald J. Holyer. 1 Oct 65, 44p. Rept. no. TR-14
Contract Nonr296401 Proj. NR017 208
Unclassified report

Descriptors: (*Thermal conductivity, Measurement), (*Silicon, Thermal conductivity), Single crystals, Test equipment, Low-temperature research, Cryogenics

A system has been designed and constructed to measure thermal conductivity by the series comparative method in the temperature range 4 to 300K. A sample temperature of 77K was reached when the cylindrical sample chamber 3-1/4 inches in diameter and 8-3/4 inches long was evacuated to a pressure of 0.000003 Torr and submerged in a bath of liquid nitrogen held in a 5-1/2 liter stainlessteel dewar. Temperatures as low as 4.2K could be obtained if the sample chamber were submerged in liquid helium. Temperatures between that of the liquid bath and room temperature were obtained by electrical heating. A simple Wheatstone bridge circuit, one arm of which was a copper resistance thermometer made from 140 ohms of B and S No. 36 copper wire, served to regulate automatically the electrical heating so as to give a drift in sample temperature of less than 0.002 deg/min. Measurements were attempted from 77K to 300K on a sample of n-type single-crystal silicon with an impurity concentration of 5X10 to the 15th power cu cm. Armco iron was used as a standard. Temperatures were measured with copper vs constantan thermocouples. The thermal conductivity of the sample was found to range from 8.7 watt/cm-degK at 98K to 1.8 watt/cm-degK at 255K. These values agree with those of Carruthers et al. Within 7% and of Glassbrenner and Slack within 10%. (Author)

AD-621 163 **See Fld. 9/5**

AD-621 175 Div. 30/5
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF APPLIED CHEMISTRY
THE ACCURATE DETERMINATION OF THE HALL COEFFICIENT OF A METAL.
Revised ed.,
by C. M. Hurd. 1 Mar 65, 5p. Rept. no. NRC-8526
Unclassified report

Pub. in the Journal of Scientific Instraments, v42 p465-9 Jul 1965 (Copies available only to DDC users). Revision of manuscript submitted 18 Jan 65.

Descriptors: (*Metals, Hall effect), (*Hall effect, Determination), Test equipment, Copper, Crystals, Single crystals

An apparatus is described for the accurate determination of the Hall coefficient R of metal samples which can be rolled and cut to a desired shape. R for polycrystalline copper has been determined in the range 77-320K with an accuracy to =0.3%. Improvements are suggested to enable single crystal samples to be measured. (Author)

AD-621 191 Div. 30/3 ,7/3
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
MUTUAL INDUCTANCE BRIDGE FOR AC SUSCEPTIBILITY MEASUREMENTS AT LOW FREQUENCIES,
by E. Maxwell. 2 Oct 64, 4p. Contract AF19 604 7344 Proj. 9764
AFOSR , 65-1379
Unclassified report

Pub. in Review of Scientific Instruments v36 n 4 p553-4 Apr 65 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electric bridges, Inductance), (*Magnetic properties, Measurement), Alternating current, Low frequency, Transformers, Preamplifiers

A mutual inductance bridge for measuring ac magnetic susceptibility at low frequencies, using standard components, is described. The equivalent of a decade mutual indicator is achieved by using a commercial decade autotransformer in combination with a small fixed mutual inductor. The Gertsch RT-61 transformer is used at 30-400 cps and lower, while the RT-60 is used at approx 1 kc. Both transformers have a nominal accuracy of 0.001%, which is more than sufficient in this use. A lownoise preamplifier followed by a lock-in amplifier is used for null detection. (Author)

AD-621 211 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
ASSEMBLY PRODUCTS INC CHESTERLAND OHIO
PRODUCTION ENGINEERING MEASURE FOR METERS, TAUT-BAND SUSPENSION, A-C MOVING IRON VANE.
Quarterly progress rept. no. 8, 1 Feb-30 Apr 65,
by R. H. Nichols. 30 Apr 65, 6p. Contract DA36 039AMC01473E
Unclassified report

Also see AD-612 481.

Descriptors: (*Measuring devices (Electrical + electronics), Manufacturing methods), Suspension devices, Voltmeters, Ammeters, Performance (Engineering), Environmental tests, Moisturing proofing, Thermal shock, Impact shock, Shock (Mechanics), Humidity, Production

Problems previously reported in the Moisture Resistance, Thermal Shock and High Impact Shock tests have been resolved. Performance on Group V tests has verified that a taut band suspension has been evolved which will withstand the shock test with no immediately apparent detrimental effects. Band breakage during vibration has been greatly reduced as the result of the conclusions of a large scale study of band breakage reported last quarter. Isolated failures due to band breakage during vibration have occurred however. All design work is essentially complete. Tooling has been completed for nearly all parts. Testing was concluded in the selection of the steel alloy for the iron vanes. Work on refining equipment and production problems was performed on a number of parts after initial samples from the tooling were received. (Author)

AD-621 221 **See Fld. 13/2**

AD-621 252 **See Fld. 9/3**

AD-621 257 **See Fld. 20/2**

AD-621 281 **See Fld. 6/12**

AD-621 286 **See Fld. 16**

AD-621 299 **See Fld. 18/4**

AD-621 425 **See Fld. 12/1**

AD-621 447 Div. 30/6
CFSTI Prices: HC $5.00 MF $1.00
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
DESIGN, INSTRUMENTATION AND PERFORMANCE OF THE UTIAS 4-IN.X 7-IN. HYPERSONIC SHOCK TUBE,
by A. G. Boyer. May 65, 171p. Rept. no. UTIAS-99
Contract AF AFOSR365 65
AFOSR , 65-1400
Unclassified report

Descriptors: (*Shock tubes, Hypersonic flow), Design, Instrumentation, Performance (Engineering), Gas flow, Gas ionization, Dissociation, Calibration, Control systems, Hazards, Safety, Operation, Canada

A detailed account is presented of the research and development, design, calibration, and performance of the UTIAS 4-in.x 7-in. Hypersonic Shock Tube, which is used as a modern aerophysical research facility for dissociated and ionized gas flows. The component design and construction features, operating and control systems, safety features, and the diaphragm techniques employed, are described. The instrumentation for monitoring tube performance and operation is also discussed. The operating characteristics, including theoretical and observed performance, are presented. An account of various problems which arose during the development and operation of this very large facility, and the corrective measures taken, is included. (Author)

AD-621 475 **See Fld. 20/1**

AD-621 482 Div. 30/3
CFSTI Prices: HC $4.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
SOME SELF-HEATING CHARACTERISTICS OF VERY SMALL RESISTANCE STRAIN GAGES.
Master's thesis,
by Anthony G. Hartman. 1964, 109p.
Unclassified report

Descriptors: (*Strain gages, Heating), Resistance (Electrical), Coils, Temperature, Adhesives, Conductivity, Heat transfer, Thermal conductivity, Convection, Foils

The self-heating of small foil resistance strain gages is studied both analytically and experimentally. The thermal resistance of the strain gage-specimen combination is obtained and utilized in relating the steady state temperature rise of the gage grid to the magnitude of the electrical current flowing through the gage. It is shown that the primary mechanism for dissipation of the gage self-heat is conduction through the gage backing, bonding adhesive, and specimen, then radiation and convection from the specimen surfaces to the environment. The heat dissipation paths provided by the

lead wires and the exposed gage grid and tab surfaces are found to account for a negligible fraction of the heat transferred. For the smallest gages the backing and adhesive contribute nearly all of the thermal resistance of the primary path. In the latter cases it is shown that gage heating is substantially independent of the thermal conductivity or size of the specimen and that the gage power dissipation per unit grid area is the dominant parameter in predicting the steady-state temperature rise of the grid.

AD-621 483 Div. 30/3 ,13/1 ,25/8
CFSTI Prices: HC $4.00 MF $0.75
NAVAL POSTGRADUATE SCHOOL MONTEREY CALIF
AN EXPERIMENTAL DETERMINATION OF HEAT TRANSFER AND FLOW FRICTION CHARACTERISTICS OF PERFORATED MATERIAL FOR COMPACT HEAT EXCHANGER SURFACES.
Master's thesis,
by John M. Bannon. 1964, 103p.
Unclassified report

Descriptors: (*Thermal conductivity, Porous materials), (*Heat exchangers, Surface properties), Heat transfer, Friction, Design, Test equipment, Heaaters, Nickel

The transient testing technique for the determination of heat transfer characteristics of a porous medium has been known since 1929. It requires a good deal of care and one of the important restrictions is that a step change in temperature must be applied to the medium at the beginning of a test run. The thesis involves the design, test and evaluation of an experimental set-up that utilizes an 'integral heater' to accomplish the step change in temperature. In addition, there is presented heat transfer and flow friction characteristics for a 20 degree skew matrix constructed from perforated nickel material. This data is compared to a 20 degree skew matrix made from stainless steel material. Also, data is presented for two 'parallel plate' matrices, one constructed from brass sheet, the other from perforated nickel material. A comparison of their relative performances is made. (Author)

AD-621 484 Div. 30/3
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
INSTABILITY OF REFRACTORY METAL THERMOCOUPLES.
Interim rept.,
by B. E. Walker,Jr., C. T. Ewing, and R. R. Miller.
26 Mar 65, 18p. Rept. no. NRL-6231
Proj. RR007 01 46 5400
Unclassified report

Descriptors: (*Thermocouples, Stability), (*Refractory metals, Thermocouples), Thermoelectricity, Contamination, Compatibility, High-temperature research, Vacuum, Ceramic materials, Selection, Furnaces, Recrystallization, Phase studies, Tungsten, Rhenium, Molybdenum

Thermoelectric instabilities of some refractory metal thermocouples were studied in the temperature range 1000 to 2000C under vacuum and neutral atmospheres. The sources of instability were found to complex, involving contamination from ceramic protection tubes and furnace environments, preferential volatilization, and various thermal anomalies such as recrystallization and phase changes in the refractory thermoelements. Refractory thermocouples and thermoelements were studied under a variety of conditions, and emf changes associated with each were noted. Recommendations were made for the selection and application of these thermocouples to attain maximum thermoelectric stability. (Author)

AD-621 491 **See Fld. 11/6**

AD-621 518 Div. 30/3 ,8/6
CFSTI Prices: HC $1.00 MF $0.50
INNSBRUCK UNIV (AUSTRIA)
MEASURING DEVICE FOR RECORDING THE FIELDS STRENGTH OF VLF SIGNALS OVER LONG PERIODS OF TIME.
Interim scientific rept.,
by Wolfram Bitterlich. 1 Jun 65, 10p. Rept. no. SR-14
Contract AF61 052 490
AFCRL , 65-624
Unclassified report

Descriptors: (*Atmospherics, Very low frequency), (*Measuring devices (Electrical + Electronic), Very low frequency), Electromagnetic waves, Propagation, Radio transmitters, Signal-to-noise ratio, Diurnal variations, Signals, Electronic equipment, Recording systems, Wiring diagrams, Dipole antennas, Periodic variations

In the present report a measuring device is described for recording continuously the field strength of the VLF transmitter GBR and of atmospherics in the same frequency band. (Author)

AD-621 566 **See Fld. 11/8**

AD-621 574 Div. 30/6 ,9/7
CFSTI Prices: HC $3.00 MF $0.50
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS AERODYNAMIC LAB
AN ELECTRON BEAM DEVICE FOR REAL GAS FLOW DIAGNOSTICS.
Technical rept.,
by S. L. Petrie. Jun 65, 56p. Rept. no. TR-1
Contract AF33 657 11060 Proj. 7065
ARL , 65-122
Unclassified report

Descriptors: (*Electron beams, Test equipment), (*Wind tunnels, Electron beams), (*Gas flow, Measurement), Spectroscopy, Calibration, Nitrogen, Molecular rotation, Vibration, Production

An electron beam device suitable for use in low density, nonradiating flows is described. It is shown that in certain ranges of gas density the electron beam can be employed to determine the rotational temperature, vibrational temperature and concentration of molecular nitrogen in a high speed air flow. The theoretical analysis required for interpretation of the data obtained with an electron beam is presented and examples of application of the technique are given. Certain design criteria for electron beam generators are discussed. (Author)

AD-621 579 **See Fld. 12/1**

AD-621 604 Div. 30/6
CFSTI Prices: HC $1.00 MF $0.50
POLITECNICO DI TORINO (ITALY)
SOME PROBLEMS ON THE PERFORMANCE AND MEASUREMENTS IN A WIND TUNNEL AT LOW VELOCITY.
Technical note 26 (Scientific rept. 2),
by Ennio Mattioli. Apr 65, 24p. Rept. no. TN-26 ,SR-2
Contract AF EOAR63 98
AFOSR , 65-1321
Unclassified report

Descriptors: (*Wind tunnels, Subsonic flow), Performance (Engineering), Measurement, Boundary layer transition, Turbulence, Italy

Experimental researches were begun some years ago in order to study the pressure gradient effect on boundary layer transition along a flat plate. Many inconveniences where encountered: they were concerning the turbulence of the free stream, the measurement of differential pressures and of velocities very low, the interference of noises on the hot wire signal. In this research is shown the study made upon these subjects and the methods used to remove some of the difficulties encountered in order to improve the measurements. (Author)

14/3. RECORDING DEVICES

AD-621 372 **See Fld. 17/2**

14/5. REPROGRAPHY

AD-620 823 **See Fld. 17/8**

AD-621 007 Div. 24/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE PHOTO-PISTOL (PISTOL TYPE PHOTO CAMERA),
by A. Batanov. 28 May 65, 7p. Rept. no. FTD-TT-65-145
TT , 65-63932
Unclassified report

Unedited rough draft trans. of Nauka i Zhizn (USSR) v31 n4 p130-1 1964.

Descriptors: (*Cameras, Design), Telephoto lenses, USSR

A description is given of the objective of the pistol-type camera announced by S. Chernin in 1963 in the journal SOVETSKOYE FOTO. With the new telephoto lens, adjustment for clearness is achieved by shifting a dispersion lens in the objective, and the focal distance is changed from 250 to 300 mm, depending upon the adjustment made for clearness. These changes, with a 1:63 illuminating power permit the photography of near objects with smaller focal distance and distant objects with greater focal length but lower illuminating power. The new objective weighs 300g.

AD-621 059 Div. 24/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
RAPID-ACTION PRINTING MECHANISM.
26 Aug 65, 5p. Rept. no. FTD-TT-65-730
TT , 65-63944
Unclassified report

Unedited rough draft trans. of Ekonomicheskaya Gazeta (USSR) 32 (157) p42 1964.

Descriptors: (*Printing, Machines), Electronic equipment, Circuits, Computers, Control systems, Automation, USSR

The Kazan Typewriter Factory has mastered the production of the rapid-action type printing mechanism 'TBPM-16/1200.' The new mechanism consists of digital wheels, a device for pulling through the paper, and an electromagnetic case. It is controlled from a special electronic unit which connects its electric circuit with an electronic computer. The unit of digital wheels has 16 printing wheels and 16 little mallets. The speed of the printing is 1,200 lines per minute. The kinematic scheme of the 'TBPM-16/1200' consists of the controlling mallets, electromagnetic printing parts, shaft with digital wheels, guiding and coloring tape, elastic clutch, damper, roll with paper, mechanism for feeding paper, generator of pulses, contact breaker, spool with coloring tape, electromagnetic clutch, lever, and terminal switch-over units. The mechanism can be used in different branches of industry for recording the parameters of high-speed processes, in systems of automation of centralized control, and traffic control. (Document quoted in its entirety.)

AD-621 069 **See Fld. 20/8**

AD-621 153 **See Fld. 4/2**

AD-621 421 Div. 24/2 ,8/7
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS

THE APPLICATION OF INFORMATION THEORY TO PHOTOGRAPHIC SYSTEMS,
by D. S. Lebedev. Jun 65, 25p. Rept. no. T-R-478
Contract AF19 628 3880
TT . 65-63974

Unclassified report

O Primenenii Teorii Informatsii k Fotograficheskim Sistemam. Trans. of Zhurnal Nauchnoi i Prikladnoi Fotgrafii i Kinematografii (USSR) v10 n1 p62-71 1965.

Descriptors: (*Communciation theory, Photographic recording systems), (*Photographic recording systems, Communication theory), Data transmission systems, Information retrieval, Optimization, Theory, Reviews, USSR

The aim of the paper is to examine and answer the question: How is information theory related to the problems of perfecting photographic systems. Some of the conclusions reached are as follows: (1) To describe the properties of photographic systems, it is advantageous to use an analogy between these systems and other systems of information storage and transmission (in particular, systems of electrical communication). This analogy follows from the general conceptions of information theory. (2) The obstacle in the path of developing optimum photographic systems is the lack of a criterion of the fidelity of reproduction of images, i. e., a criterion of the closeness (similarity) of images from the viewpoint of the recipient. Such a criterion must be established by the methods of biophysical or psychological research (and not by information-theory methods). (3) Strictly information-theory concepts (viz., quantity of information, entropy, and capacity) have a rather limited application to photographic systems, because these concepts apply to the measurement of the efficiency of encoding and decoding, and it is nearly impossible to carry out these operations by purely photographic methods. (Author)

AD-621 479 Div. 24/3
CFSTI Prices: HC $1.00 MF $0.50
SMC EQUIPMENT MANUALS FIELD OFFICE CHAMBERSBURG PA IMPROVEMENTS BRANCH
AN EXPERIMENTAL INVESTIGATION OF MICROPRINTING BY THE OFFSET METHOD.
Technical rept.,
by Oliver F. Redd. Nov 64, 9p. Rept. no. 65-10

Unclassified report

Descriptors: (*Printing, Scientific research), Photographic techniques, Microfilm, Microphotography, Photoengraving

Continuous tone original art was photographed to produce a screened negative which was contact printed. The fullscale positive halftone was photographically reduced 5.55 X to make a second negative which was contact printed on the offset plate. This reduction was equivalent to printing halftones of 665 and 745 lines per inch. Subsequent printing steps were done using the conventional offset method. A lexical (unscreened) page was similarly reduced and printed. Macroscopic examination of printed materials mentioned above indicated that the halftones were good enough for identification in P-manuals, but were questionable for other uses. Reproduction of 10 point lexical material was excellent. Microscopic examination and successive trials of offset printing of the same screened art indicated that the tonal range of the art must be reduced considerably to avoid complete loss of highlights or loss of tone in the shadows. (Author)

AD-621 480 Div. 24/3
CFSTI Prices: HC $1.00 MF $0.50
SMC EQUIPMENT MANUALS FIELD OFFICE CHAMBERSBURG PA IMPROVEMENTS BRANCH
AN EXPERIMENTAL INVESTIGATION OF MICROPRINGING BY THE OFFSET METHOD, SUPPLEMENT.
Technical rept.,
by Oliver F. Redd. Aug 65, 8p. Rept. no. 65-10 suppl.

Unclassified report

See also AD-621 479.

Descriptors: (*Printing, Scientific research), Photographic techniques, Microfilm, Microphotography, Photoengraving

The original report covered the experimental work of printing lexical material and half-tones at a reduction of 5.55 to 1. The quality of the samples produced clearly indicated that the limitation of the offset method had not been reached for lexical material. However, the halftones printed at 665 and 745 lines per inch (26 and 29 lines per mm) indicated that the tonal range should be reduced to prevent loss of detail in both high light and shadow areas. A supplementary test has been made primarily to check the possibility of further reduction of lexical material. As line art is legible at greater reduction than continuous tone, it was included in this test. A survey of art preparation groups showed a preference for and a trend toward more line art and fewer halftones. This preference and trend will favor microprinting by making greater reduction practical, and is another reason for including line art. A microcopy test chart was included to provide a basis for quantitative evaluation of the reductions. (Author)

AD-621 595 Div. 24/2 ,25/4
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
RESOLVING POWER AND THE DETECTION OF LINEAR DETAIL,
by W. N. Charman. 1965, 16p. Rept. no. NRC-8163

Unclassified report

Pub. in Canadian Surveyor v19 n2 p190-205 Jun 1965 (Copies available only to DDC users).

Descriptors: (*Resolution, Aerial photography), (*Photographic images, Resolution), (*Aerial photography, Resolution), Optical equipment, Photographic equipment, Photographic techniques, Optics

The ability of a photographic system to resolve and detect linear details is discussed in terms of the spatial frequency spectra of the details, the optical transfer function of the system and the threshold of the detector used with the system. It is shown that there is no simple relationship between the resolving power of the system and the size of the linear detail that the system is capable of detecting. (Author)

15/2. CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL WARFARE

AD-620 832 **See Fld. 6/15**

AD-621 347 **See Fld. 17/5**

AD-621 522 **See Fld. 11/7**

15/3. DEFENSE

AD-620 893 Div. 18/1 ,13/10
CFSTI Prices: HC $1.00 MF $0.50
DIKEWOOD CORP ALBUQUERQUE N MEX
VULNERABILITY REDUCTION USING MOVEMENT AND SHELTER.
Summary rept., vol. 1,
by D. E. Brannon, R. J. Flanagan, S. H. Dike, K. D. Granzow, and A. R. Durand. Jun 65, 11p.
Rept. no. DC-FR-1039 v.1
Contract OCD OS63 109

Unclassified report

Descriptors: (*Civil defense systems, Nuclear warfare), (*Nuclear warfare, Civil defense systems), (*Shelters, Civil defense systems), (*Urban planning, Civil defense systems), Nuclear warfare casualties, Reduction, Protective coverings, Site selection, Population, Scheduling, Optimization, Mathematical models, Programming (Computers)

This report describes an effort to find preferred mixtures of movement and shelter as Civil Defense responses to the threat of nuclear war.

AD-620 894 Div. 18/1 ,13/10
CFSTI Prices: HC $4.00 MF $1.00
DIKEWOOD CORP ALBUQUERQUE N MEX
VULNERABILITY REDUCTION USING MOVEMENT AND SHELTER.
Final rept., vol. 2,
by R. J. Flanagan, D. E. Brannon, S. H. Dike, K. D. Granzow, and A. R. Durand. Jun 65, 143p.
Rept. no. DC-FR-1039 v. 2
Contract OCD OS63 109

Unclassified report

See also AD-620 893.

Descriptors: (*Civil defense systems, Nuclear warfare), (*Nuclear warfare, Civil defense systems), (*Shelters, Civil defense systems), (*Urban planning, Civil defense systems), Nuclear warfare casualties, Reduction, Protective coverings, Site selection, Transportation, Population, Scheduling, Mathematical models, Programming (Computers)

This report describes an effort to find preferred mixtures of movement and shelter as Civil Defense responses to the threat of nuclear war. Two approaches were followed: (1) Mixtures of movement and shelter were studied in three steps. These consisted of: Postulation of alternative movement and shelter policies, Development of movement and shelter plans based on these policies, Evaluation of plans developed in (b) against the range of attack conditions considered reasonable. (2) A mathematical model was constructed to provide a vehicle for sensitivity analyses. A technique for planning large-scale strategic movements was developed and applied to several particular places. The technique is believed to be developed sufficiently to provide a basis for planning a first-generation strategic movement capability for the U. S. Two computer programs were developed as tools for evaluating strategic movement against particular attacks and for evaluating various trans-attack responses to large-scale movements interrupted by war. Blast shelter planning programs are also reviewed and developed further. Evaluation techniques are already available. The mathematical model approach ended with the development of a computer program for finding the shelter location and hardness required to maximize overall survival probability for various warning time probability density functions and attack and movement assumptions. (Author)

AD-621 127 **See Fld. 18/3**

AD-621 339 Div. 18/1 ,18/7 ,22/13,31/9
CFSTI Prices: HC $6.00 MF $1.50
LIBRARY OF CONGRESS WASHINGTON D C NAVY RESEARCH SECTION
A CATALOG OF OSRD REPORTS: DIVISION 6, SUBSURFACE WARFARE,
by Sylvia E. Weiss, and Herbert S. White. Apr 52, 268p.

Unclassified report

Declassified 1 Dec 64. Released 2 Feb 65 as PB-166 673. HC$6.00, MF$1.50.

Descriptors: (*Undersea warfare, Bibliographies), (*Antisubmarine warfare, Bibliographies), (*Underwater sound, Bibliographies), (*Naval research, Undersea warefare), Catalogs, Scientific research, Underwater equipment, Underwater sound equipment, Sonar, Underwater ordnance

AD-621 377 See Fld. 13/13

15/4. INTELLIGENCE

AD-621 247 Div. 18/2 ,18/3 ,18/4
CFSTI Prices: HC $2.00 MF $0.50
CRAIG SYSTEMS INC LAWRENCE MASS
ECHELON CONTROL MODULE FACILITY, SHELTERS AND TRANSPORTERS FOR MOBILE WING RECONNAISSANCE TECHNICAL SQUADRON.
Technical rept.,
by Stanford T. Hovey. Aug 65, 50p. Contract AF30 602 3193 Proj. 6506
RADC , TR-65-252

Unclassified report

Descriptors: (*Aerial reconnaissance, Ground support equipment), (*Combat information centers, Mobile), (*Military intelligence, Data processing systems), (*Data processing systems, Military intelligence), Armed forces operations, Command + control systems, Shelters, Transportation, Limited war

The Mobile Wing Reconnaissance Technical Squadron (MWRTS) is a major subsystem of the Limited Warfare Intelligence Reduction Complex being developed by Rome Air Development Center (AFSC). It is a computerized, field deployable, reconnaissance data reduction facility. The system is of modular design; each operational task is assigned to a specific shelter which contains the appropriate, specialized equipments. Each shelter possesses a ground transport capability and three can be airlifted aboard a single C-130 aircraft. The three topics of the MWRTS which are the special interest of this TDR are: Echelon Control Module which performs the command and coordination function within the MWRTS; shelters designed for other MWRTS modules; and the transport system. (Author)

AD-621 519 Div. 18/2 ,30/2
CFSTI Prices: HC $6.00 MF $1.25
INFORMATICS INC CULVER CITY CALIF
MWRTS OPERATIONAL PROGRAM ANALYSIS AND INTEGRATION.
Final technical rept. for 13 Nov 64-13 May 65,
by Marvin L. Howard. Aug 65, 214p. Rept. no. TR-65-83-3
Contract AF30 602 3597 Proj. 6506
RADC , TR-65-235

Unclassified report

Descriptors: (*Aerial reconnaissance, Data processing systems), (*Data processing systems, Aerial reconnaissance), Military organizations, Systems engineering, Design, Reconnaissance planes, Computers, Analysis

The report presents the results of a joint RADCInformatics systems analysis to define the data processing operations required to meet intelligence data handling requirements of the Mobile Wing Reconnaissance Technical Squadron (MWRTS). The results of this analysis are: the system design, the identification and specification of the computer programs required to implement the design, and the manual procedures which will be followed in obtaining the defined data processing support. The MWRTS is a field deployable intelligence data extraction facility of highly advanced design. It is a computer based facility designed to process the products of multi-sensor tactical reconnaissance aircraft. The system will provide the capability to process a vast amount of raw multi-sensor data into useful information within the time constraints of the tactical environment. The MWRTS is a major subsystem of the Limited War Intelligence Reduction Complex (LWIRC) which is designed to provide tactical reconnaissance intelligence interpretation in support of world wide operations.

15/5. LOGISTICS

AD-621 150 See Fld. 12/1

AD-621 247 See Fld. 15/4

AD-621 361 Div. 18/3 ,18/7
CFSTI Prices: HC $4.00 MF $1.00
BATTELLE MEMORIAL INST COLUMBUS OHIO RE
BICYCLE TROOPS.
Rept. on Proj. AGILE,
by R. S. Kohn. 30 Sep 65, 139p. Rept. no. BAT-171-25
Contract SD171
TT , 65-63970

Unclassified report

Includes trans. of excerpts from mono. die Radfahrtruppe, Nach Kreigserfahrungen (Bicycle Troops, Based on War Experiences) Berlin, 1925, 92p.

Descriptors: (*Logistics, Armed forces transportation), (*Unconventional warfare, Armed forces transportation), (*Armed forces transportation, Unconventional warfare), History, Military tactics, Guerrilla warfare, Terrain

The report presents a history of the use of bicycles for transportation by combat troops prior to World War I, during World War I and II, and more recently the use of bicycles in guerrilla warfare. The armament, mobility, speed, distance, design, and load-carrying capacity of bicycles for transportation in remote areas and guerrilla warfare are discussed. The effect of terrain on the utilization of bicycles, the organization, strength, and tactics of bicycle units, and the training of combat troops using the bicycles are also considered. (Author)

AD-621 380 See Fld. 22

15/7. OPERATIONS, STRATEGY, AND TACTICS

AD-621 247 See Fld. 15/4

AD-621 322 Div. 18/4 ,32/8 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
DILEMMAS IN THE POLITICO-MILITARY CONDUCT OF ESCALATING CRISES,
by H. Averch, and M. M. Lavin. Aug 65, 13p. Rept. no. P-3205

Unclassified report

Prepared for presentation at the Annual Meeting of Western Section, Operations Research Society of America (11th), 27 Sep-1 Oct 65.

Descriptors: (*Limited war, Game theory), Decision theory, Decision making, Political science, Military organizations, Strategic Air Command, Command + control systems, Civil defense systems

The paper focuses on the dilemmas the political decision maker faces in conveying his intended conduct of national crises, particularly coping with rapidly escalating actions in limited warfare, and on the problems the military agencies have in adapting to the intended conduct. The hand-played game involved 16 participants who were concerned with a RED team representing interests of adversaries to the U.S., a BLUE team representing U.S. and its possible allies, and a CONTROL team acting as game manager and as the world environment exterior to the crisis principals. The BLUE team was structured into 4 sections; a supreme political authority, BLUE POLITICAL; a military command level equivalent to the National Military Command Center, and 2 military headquarters equivalent to those of SAC and NORAD. During the gaming, political decisions did not produce consistent military actions nor were military sections able to adapt promptly to political constraints. Political leaders were often deficient in adapting policies to command-control constraints that emerged during interactions with the subordinate military sections. These failures are regarded as arising from differences in responsibilities in perceptions, and in operational styles among the different agencies.

AD-621 339 See Fld. 15/3

AD-621 361 See Fld. 15/5

AD-621 453 See Fld. 5/9

AD-621 477 Div. 18/7
CFSTI Prices: HC $2.00 MF $0.50
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
ON SOME STOCHASTIC TACTICAL ANTISUBMARINE GAMES.
Systems research memo.,
by A. Charnes, and R. G. Schroeder. Aug 65, 28p. Rept. no. SRM-131
Contract Nonr122810 ,DA31 124AR0 D322
Proj. NR047 021

Descriptors: (*Antisubmarine warfare, Game theory), (*Tactical warfare, Antisubmarine warfare), (*Stochastic processes, Game theory), Linear programming, Optimization, Decision theory, Military tactics

In this paper some mathematical models are developed of tactical problems which arise in Antisubmarine Warfare. Specifically, the authors consider a game of pursuit between a hunter-killer force, player 1, and a possible submarine, player 2. The game consists of a sequence of moves and it terminates when player 2 is caught or evades player 1. When the players move they observe the actual tactical configuration of the forces (state) and each player chooses a tactical plan from a finite collection. This joint choice of tactical plans determines an immediate payoff and a transition probability distribution over the states. Hence an expected payoff function is defined. Formally this game is a Terminating Stochastic Game and Shapley demonstrated the existence of a value and optimal strategies (solution). An iterative technique is proposed to approximate the solution to within desired accuracy. Each iteration of the technique is obtained by solving a set of linear programs.

16. MISSILE TECHNOLOGY

AD-620 823 See Fld. 17/8

AD-620 834 See Fld. 22

AD-620 836 See Fld. 5/3

AD-620 841 See Fld. 5/9

AD-620 866 See Fld. 22

AD-620 926 See Fld. 22

AD-620 947 See Fld. 6/16

AD-620 959 Div. 12/1 ,9/7
CFSTI Prices: HC $7.85 MF $2.25
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT
PRESSURE MEASUREMENTS AT MACH 8 ON AN AERODYNAMICALLY CONTROLLABLE WINGED REENTRY CONFIGURATION. PART OF AN INVESTIGATION OF HYPERSONIC FLOW SEPARATION AND CONTROL CHARACTERISTICS.
Technical documentary rept.,
by Lawrence Meckler. Jun 65, 485p. Contract AF33 616 8130 Proj. 8219 Task 821902
FDL , TDR-64-124

Unclassified report

Descriptors: (*Re-entry vehicles, Hypersonic characteristics), Hypersonic flow, Separation, Delta wings, Pressure, Aerodynamic loading, Trailing control surfaces, Cylindrical bodies, Angle of attack, Conical bodies, Graphics

Pressure data were obtained at Mach 8 for a winged reentry configuration having aerodynamic controls. The basic model consisted of a clipped delta wing with an overslung cone-cylinder body. The main controls tested were partial span trailing edge flaps. Data were also obtained on the effect of tip fins, hemisphere-cylinder body and a trailing edge spoiler. The data were obtained over an angle of attack range of -50 deg. to +50 deg. Due to load limitations on the controls the unit test section Reynolds number varied from 3,300,000 at low angle of attack to 2,500,000 at high angle of attack. (Author)

AD-620 975 **See Fld. 22**

AD-620 979 **See Fld. 22**

AD-621 000 **See Fld. 3/1**

AD-621 155 **See Fld. 4/2**

AD-621 189 **See Fld. 22**

AD-621 286 Div. 12/1 ,30/3
CFSTI Prices: HC $6.00 MF $1.25
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SOVIET SATELLITES AND COSMIC ROCKET,
by S. G. Aleksandrov, and R. E. Fedorov. Jul 60, 255p. Rept. no. MCL-418/V TT , 60-23869

Unclassified report

Trans. of mono. Sovetskie Sputniki i Kosmicheskaya Raketa, Moscow, 1959 233p.

Descriptors: (*Satellites (Artificial), USSR), Space flight, Orbital trajectories, Interplanetary trajectories, Scientific satellites, Instrumentation, Upper atmosphere, Cosmic rays, Meteors, Electrostatic fields, Terrestrial magnetism, Solar radiation, Space biology

This book acquaints the reader with the basic problems connected with the creation of artificial earth satellites and the cosmic rocket and with the technique of scientific experiments in the upper layers of the atmosphere and in cosmic space. It gives detailed information on the Soviet artificial earth satellites and the results of scientific investigations on such satellites. It discusses the significance of artificial satellites in solving the problem of interplanetary flights.

AD-621 325 **See Fld. 22**

AD-621 379 **See Fld. 5/10**

AD-621 380 **See Fld. 22**

AD-621 452 Div. 12/1 ,12/2 ,22/7
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
VELOCITY AND ALTITUDE ERROR COMPENSATION FOR BALLISTIC MISSILE RANGE CONTROL TO A TARGET.
Master's thesis,
by Lavern D. Beggs. Aug 65, 68p. Rept. no. GA/EE/65-2

Unclassified report

Descriptors: (*Guided missiles (Surface-to-Surface), Guidance), (*Impact prediction, Guided missiles (Surfaceto-surface)), (*Inertial guidance, Guided missiles (Surface-to-Surface)), (*Range finding, Guided missiles (Surface-to-Surface)), Guided missile trajectories, Velocity, Height finding, Midcourse guidance, Simulation, Digital computers

The purpose of this study was to determine whether simple cutoff parameters, such as missile velocity and altitude, can be used to accurately predict range to a target. The work was accomplished by using the Six Degree of Freedom (SDF) computer program in a 7094 digital computer. It was found that sq V sub t (r), the product of the total velocity squared and the radius to the missile from the earth's center, is a good cutoff parameter for a nonrotating earth when used in the proper formulae. For a rotating earth, the cutoff parameter becomes V to the n power sub t (r) where V sub t is the total velocity corrected for earth's rotation and gravity variations and n is some power to be determined by trial and error. This cutoff parameter was also tested for velocity and altitude measurements uncorrected for earth's rotation and gravity variation. For the three basic problems mentioned, it was possible to find formulae which could be used to control great circle downrange to within one nautical mile at 4800 NM range. It was concluded that velocity and altitude plus earth's radius can be used as a cutoff parameter to control range at 4800 NM. It is recommended that further studies investigate the effects of pitch programming and azimuth corrections on range control. (Author)

AD-621 501 **See Fld. 20/3**

AD-621 584 **See Fld. 22**

AD-621 584 **See Fld. 22**

17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

AD-621 137 **See Fld. 14/2**

AD-621 148 **See Fld. 9/2**

AD-621 452 **See Fld. 16**

17/1. ACOUSTIC DETECTION

AD-621 372 **See Fld. 17/2**

17/2. COMMUNICATIONS

AD-620 825 Div. 5/6 ,25/4
CFSTI Prices: HC $2.00 MF $0.50
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
MICROWAVE OPTICAL RECEIVER TECHNIQUES.
Interim engineering rept. no. 1, 1 Jun-31 Aug 65, by J. Richard Kerr. 31 Aug 65, 50p. Contract AF33 615 3108

Unclassified report

Descriptors: (*Light communication systems, Demodulators), (*Demodulators, Light communication systems), (*Phototubes, Light communication systems), (*Microwave communication systems, Light communication systems), Optical equipment, Lasers, Light, Modulators, Broadband, Photomultipliers, Demodulation, Optics, Feasibility studies

This report presents the results of the first quarter of effort on a one-year applied research program on the use of various techniques for microwave optical communications through the atmosphere. Theoretical considerations of the relative advantages of direct and heterodyne optical receivers, taking into account the vastly increased sensitivity of new phototubes under development in this laboratory, show that heterodyne detection may in many cases by less advantageous than popularly assumed. A qualitative examination of the different possibilities for optical and subcarrier modulation in wideband systems illuminates the system requirements. The use of multimode lasers in such systems is also studied. Experiments have centered on the laboratory optimization of the advanced multiplier phototubes, in order to obtain a consistent, rugged unit for use in the outdoor experiments. A system has been constructed which eliminates the problem of microwave leakage pickup, while avoiding the necessity for screening or shielding techniques. (Author)

AD-620 941 Div. 5/5 ,30/2 ,30/5
CFSTI Prices: HC $3.00 MF $0.75
ELECTRONIC ASSOCIATES INC LONG BRANCH N J
VOICE ACTUATED ADDRESS MECHANISM.
Quarterly progress rept. no. 1, 1 Mar-31 May 65, by Donald Fraipont. 14 Jul 65, 99p. Contract DA28 043AMC01223E Proj. 1P6 20501A448 02 20

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Speech recognition, Telephone communication systems), (*Telephone communication systems, Speech recognition), Feasibility, Simulation, Army equipment, Digital computers, Analog computers, Magnetic tape, Programming (Computers), Punched tape, Learning, Voice communication systems

This report on the simulation of VAAM includes the full design of the preprocessor as implemented on the TR-48 analog computer and also the design of the programs utilized by the Digital Operations System-350. For reasons of efficiency the Phase I effort was broken into three tasks. First, recordings of various speakers voicing the vocabulary words were digitized and punched on paper tape. Second, the paper tapes were input to the DDP-24 digital computer to train VAAM to recognize the vocabulary. Third, the reference functions created in the learning task were evaluated by using voiced inputs directly on-line with the full system. It was found that the sample of single voicings by 26 speakers was an inadequate training set for a good extrapolation recognition rate. The extrapolated recognition rate was approximately 55 percent, ranging from 35 to 80 percent for different speakers. An attempt at improving results by on-line training pointed out the inefficiency of this mode of operation, and the improvement was small. The conclusions are that the approach of the Andromeda Inc. algorithm is feasible but more training is required. The training must be automated by adding some mass storage medium such as digital magnetic tape to the system. (Author)

AD-621 053 Div. 5/6 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
OPTICAL COMMUNICATIONS,
by Liu Chia-sung. 28 Jun 65, 11p. Rept. no. FTD-TT-65-95 TT , 65-63953

Unclassified report

Edited trans. of K'o Hsueh Ta Chung (Chinese People's Republic) n2 p46-7, 64 1964.

Descriptors: (*Light communication systems, Lasers), (*Lasers, Light communication systems), Amplitude modulation, Waveguides, Photomultipliers, China, Theory

A general description of the theory and applications of optical communication systems is presented.

AD-621 231 Div. 5/6
CFSTI Prices: HC $3.00 MF $0.75
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
DEVELOPMENT OF CRITERIA FOR EVALUATION OF LARGE-SCREEN DISPLAYS.
Final technical rept.,
by Carl A. Silver, Daniel Landis, and James M. Jones. Aug 65, 81p. Rept. no. TR-1-052
Contract AF30 602 3302 Proj. 5597 Task 559705
RADC , TR-65-198
Unclassified report

Descriptors: (*Display systems, Analysis), (*Command + control systems, Display systems), Maps, Human engineering, Decision making, Effectiveness, Colors

The research was directed toward developing a metric of display quality for evaluation of large-screen displays and toward developing a criterion to validate the metric. Two approaches were used. In the first, multidimensional analysis (MDA) was used to test the hyopthesis that, other things being equal, display quality was related to the number of perceived dimensions of information content; the results of the test failed to support the hypothesis. In the second approach, a game situation was used in which the monetary value of the subjects' decisions could be calculated. Several display parameters, including format, information density, and color, were manipulated. The monetary value of the decisions, or 'decision value' was found to be a reliable and valid measure of display quality. It is recommended that MDA and decision quality be combined to formulate a predictive model of display quality. Research to this end should be conducted using a wide range of stimuli and subject proficiency levels. (Author)

AD-621 278 See Fld. 6/16

AD-621 325 See Fld. 22

AD-621 372 Div. 5/4 ,5/3 ,25/1 ,6/1
CFSTI Prices: HC $3.00 MF $0.75
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL WASHINGTON D C MINE ADVISORY COMMITTEE
ULTRASONIC IMAGING,
by R. Stuart Mackay. Apr 65, 82p. Rept. no. NRC:MAC:2016
Contract Nonr230010
Unclassified report

Proceedings of a Symposium on Acoustic Imaging and Pulsed-Gated Light, Berkeley, Calif., 1-2 Dec 64.

Descriptors: (*Television display systems, Sound signals), (*Ultrasonic radiation, Images), (*Acoustics, Display systems), (*Sound signals, Images), Sound ranging, Sound, Television converters, Image tubes, Video signals, Acoustic equipment, Electron optics, Reviews

Report consists of three papers which outline the stateof-the-art in the conversion of reflected acoustic energy into a visual image. The underlying principles of ultrasonic imaging, the various types of image sensors, and the potentials and limitations of various techniques are discussed in detail. (Author)

17/2.1 RADIO COMMUNICATIONS

AD-620 847 See Fld. 5/1

AD-621 061 See Fld. 20/14

AD-621 139 Div. 5/2
CFSTI Prices: HC $4.00 MF $1.00
ELECTRO-MECHANICAL RESEARCH INC SARASOTA FLA
TELEMETRY FM/FM BASEBAND STRUCTURE STUDY. VOLUME I.
Final rept., vol. 1,
by E. B. Campbell, and W. R. Herbert. 14 Jun 65, 175p. Contract DA29 040AMC746R
Unclassified report

Descriptors: (*Telemeter systems, Bandwidth), Frequency modulation, Multiple operation, Radio transmission, Low frequency, Radio equipment, Systems engineering, Multiplex, Feasibility studies

This final report describes an experimental evaluation program which was undertaken to investigate the technical feasibility of expanding the Inter-Range Instrumentation Group (IRIG) FM/FM baseband to include a larger number of channels, choice of constant- or proportional-bandwidth subcarrier channels, and greater flexibility in operating parameters. The program consists of: an evaluation of typical field equipment; design of an expanded proportional-bandwidth baseband, a constantbandwidth baseband and a baseband composed of combinations of constant and proportional-bandwidth channels; and an experimental evaluation of each baseband using typical field equipment in a complete laboratory telemeter. Results are obtained for operation of the standard IRIG baseband at deviation ratios of 1, 2, and 5, as well as operation of the baseband with higher frequency channels at 93 kc, 124 kc, and 165 kc. A 21-channel constant-bandwidth baseband with channels spaced 8 kc apart from 16 kc and deviated =2 kc is evaluated at deviation ratios of 1, 2, and 4. In addition, a baseband composed of the first 11 IRIG channels plus the 21 constantbandwidth channels is evaluated. Recommendations for expansion and operation of the FM/FM baseband are given as well as a discussion of the results of the system evaluation test. This report thus provides technical information which may be used by the Telemetry Working Group (TWG) of IRIG for consideration of expansion of the FM/FM baseband structure, but should in no way be considered to represent recommendations of the TWG or IRIG. (Author)

AD-621 140 Div. 5/2
CFSTI Prices: HC $7.00 MF $1.50
ELECTRO-MECHANICAL RESEARCH INC SARASOTA FLA
TELEMETRY FM/FM BASEBAND STRUCTURE STUDY. VOLUME II.
Final rept., vol. 2,
by E. B. Campbell, and W. R. Herbert. 14 Jun 65, 333p. Contract DA29 040AMC746R
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale. See also AD-621 139.

Descriptors: (*Telemeter systems, Bandwidth), Frequency modulation, Multiple operation, Radio transmission, Low frequency, Radio equipment, Systems engineering, Multiplex, Feasibility studies

This volume contains the procedures used and data measured as part of a baseband expansion study. In essence, the program consisted of an evaluation of equipment, a study to determine a feasible baseband expansion, and a program of experimentation to evaluate expansion and provide recommendations for systems application. Telemetry equipment representative of that typical in field use was gathered and evaluated to determine if there were any characteristics which would prohibit its use in an FM/FM baseband expanded in frequency to 200 kc. Those parameters which were thought to contribute to total system error were also evaluated. Parameters such as receiver IF-envelope delay variation, transmitter dynamic linearity, tape-recorder harmonic distortion, etc., were measured. Where possible, similar units from different manufacturers were obtained. In order to determine the feasibility of the recommended expansions of the FM/FM basebands, a complete laboratory telemeter was constructed and several basebands were evaluated using specific system tests. The system tests included experimental optimization of the transmitter pre-emphasis, intermodulation, signal-to-noise and system error tests. Determination of the effect of post detection recording, system accuracy, and applicability for pulse modulation were considered as well. (Author)

AD-621 325 See Fld. 22

17/5. INFRARED AND ULTRAVIOLET DETECTION

AD-621 347 Div. 6/3 ,3/4
CFSTI Prices: HC $1.00 MF $0.50
BECKMAN INSTRUMENTS INC FULLERTON CALIF SPECIAL PROJECTS DIV
OZONE COMPENSATED MONOBEAM PNEUMATIC DETECTOR,
Final rept.
21 Jun 65, 17p. Rept. no. TM-213
Contract DA18 035AMC314A
Unclassified report

Descriptors: (*Infrared detectors, Chemical warfare agents), Halogenated hydrocarbons, Argon

A three-section Monobeam Pneumatic Detector has been designed and fabricated. The gas charges employed in this detector have been selected to allow nearly complete cancellation of response to ozone. The mechanical design provides a factor of 75 improvement in signal to microphonic noise ratio compared to previous Monobeam detectors. Measurement of response and noise characteristics by the U. S. Naval Ordnance Laboratory indicates a P sub N mm of 8.5 x 10 to the -10th power watts/cps1/2 at the peak wavelength of 9.8 microns. (Author)

17/7. NAVIGATION AND GUIDANCE

AD-620 837 Div. 19/5
CFSTI Prices: HC $4.00 MF $1.00
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE GYROSCOPE IN GIMBAL SUSPENSION,
by Evgenii Leopoldovich Nikolai. 18 Aug 65, 164p. Rept. no. FTD-TT-65-416
TT , 65-63870
Unclassified report

Unedited rough draft trans. of mono Giroskop v Kardanovom Podvese, Moscow, 1964 p1-136. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Gyroscopes, Gimbals), (*Gimbals, Gyroscopes), Motion, Friction, Stability, Mathematical analysis, USSR

Contents: Differential equations of motion of a gyroscope in a gimbal mount; Stability of the axis of a rapidly spinning gyroscope; Pseudoregular precession of a gyroscope acted on by a constant moment; The case of constant friction at the gimbal axes. The representative point method; Elementary cases of gyroscope motion in the presence of friction at the gimbal axes; Small oscillations of a balanced gyroscope in the presence of friction at the gimbal axes; Pseudoregular precession of a gyroscope in the presence of friction at the gimbal axes; Motion of a gyroscope in the presence of friction forces proportional to the normal components of the dynamic reactions; Present state of the theory of the astatic gyroscope in a gimbal mount.

AD-620 876 See Fld. 22

AD-620 966 Div. 19/3 ,8/2 ,8/6
CFSTI Prices: HC $3.00 MF $0.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PRINCIPLES OF RADIO DIRECTION FINDING (CHAPTERS 9, 10, AND 11),
by I. S. Kukes, and M. E. Starik. 6 Aug 65. 73p.
Rept. no. FTD-MT-65-58
TT . 65-63907

Unclassified report

Edited machine trans. of mono. Osnovy Radiopelengatsii. Moscow. p517-41 and 636-40 1962. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Direction finding, Radio equipment), (*Radio equipment, Direction finding), Electromagnetism, Position finding, Radio waves, Propagation, Theory, USSR

AD-620 979 **See Fld. 22**

AD-620 985 Div. 19/3 ,1/5 ,8/3
CFSTI Prices: HC $4.00 MF $1.00
COLLINS RADIO CO CEDAR RAPIDS IOWA
TACAN/DME MONITOR EQUIPMENT.
Final rept.,
by J. H. Sprengeler. Oct 64. 126p. Contract ARDS483 Proj. 330 006 01N
SRDS . RD-64-137

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Monitors, Navigational aids), (*Navigational aids, Monitors), (*Test equipment (Electronics), Navigational aids), (*Radio navigation, Test equipment (Electronics)), Civil aviation, Aviation safety, Distance-measuring equipment, Reliability (Electronics), Failure (Mechanics)

The major objectives of reliability, accuracy, testing and maintenance, and fail-safeness are discussed in sections I and II. Methods and techniques employed to achieve the stated objectives are discussed in sections II and III. A brief discussion of the salient features of each monitor unit, together with a summary of the characteristics of each unit, is given in section III. The mean-time-betweenfailure prediction and the method employed in the calculation of MTBF (mean-time-between-failure) is discussed in section IV. The contractor's conclusions are stated in section VIII. Sections VI and VII contain the production test data and type test data respectively. A detailed test procedure is also included. (Author)

AD-621 170 **See Fld. 10**

17/8. OPTICAL DETECTION

AD-620 823 Div. 6/5 ,24/1 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
TRIAXIAL AUTOMATIC PHOTO-CAMERA FOR OBSERVING MAN-MADE EARTH SATELLITES,
by M. K. Abele. 18 Aug 65. 16p. Rept. no. FTD-TT-65-439
TT . 65-63867

Unclassified report

Unedited rough draft trans. of Nablyudeniya Byulleten (Spetsialnyuy Vypusk) (USSR) n1 p55-61 1962.

Descriptors: (*Tracking cameras, Image motion compensation), (*Photographic equipment, Tracking cameras), Satellites (Artificial), Photography, Position finding, Camera components + accessories, USSR

A compensation method is used for satellite tracking with a photographic camera (f=75 cm., D/f=1:3.5, field of view 4 degrees x 5 degrees). A frame with the film placed in the focal plane of the objective lens vibrates in the direction of the track with the velocity of the image of the satellite. The vibrational motions of the frame as well as the rotation of the camera, the guiding and operating of the shutter are performed by means of an electronicprogramming device according to an approximate formula omega = omega sub o sq cor e. If the rotational velocity of the camera is not the same as that of the satellite a correction by hand can be made. Photographs of bright objects are taken on a fixed film with a rotating obturator. The time of observation is marked by means of a quartz clock. It is possible to track moving objects down to 10m, the internal error of position determination being = (0 min, 5 + 1 min). (Author)

17/9. RADAR DETECTION

AD-620 852 Div. 6/6 ,8/2
CFSTI Prices: HC $2.00 MF $0.50
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METEOROLOGY
AN F-M SWEEP INTEGRATOR FOR QUANTITATIVE RADAR DISPLAYS.
Research rept. on Weather Radar Research,
by Donat U. Hoegl. Mar 65. 33p. Rept. no. RR-37
Contract DA36 039AMC02225E Proj. DA 1V014501B53A0702

Unclassified report

Descriptors: (*Meteorological radar, Display systems), (*Integrators, Radar equipment), (*Display systems, Radar equipment), Radar reflections, Logarithmic amplifiers, Delay lines, Trigger circuits, Frequency modulation, Pulse integrators, Corrections

A system which displays radar weather echoes quantitatively is described. The video signal from a logarithmic receiver is averaged in a delay line integrator to reduce its fluctuations about the mean value, and a correction is applied to compensate for the spreading of the radar beam with range. It is then quantized into ten levels and displayed on plan position or range height indicators. Both block diagrams and detailed circuit diagrams are included. Advantages of this system over earlier delay line integrators for weather echoes result from the use of frequency modulation in the delay line loop. After integration of 24 pulses, the standard deviation of the fluctuating signal is reduced to approximately 20 per cent as compared with 100 per cent for no integration at all. (Author)

AD-620 872 **See Fld. 9/5**

AD-621 148 **See Fld. 9/2**

AD-621 568 **See Fld. 20/14**

18/2. ISOTOPES

AD-621 388 Div. 20/4 ,20/1 ,20/6
LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS
MASSES OF THE STABLE CHLORINE ISOTOPES,
by J. W. Dewdney, and K. T. Bainbridge. 22 Dec 64. 5p. Contract Nonr186619

Unclassified report

Pub. in Physical Review v138 n3B pB540-4 May 10 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Stable isotopes, Chlorine), (*Mass spectrum, Chlorine), Mass number, Nuclear binding energy

The mass differences between the components of several doublets which involve the stable chorine isotopes have been measured in a large mass spectrometer operating at a resolving power, at the base of the peaks, of 100,000 or better. These measurements lead to the following values of atomic mass, expressed as mass excesses on the C12= 12 u scale: C137=-34 099.73=0.95 micro-u; C135=-31 148.62=0.68 micro-u; C137-C135=-2951.11=0.59 micro-u. (Author)

AD-621 440 Div. 20/8
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
APPLICATIONS OF RADIOISOTOPES FOR NAVAL FIELD ESTABLISHMENTS.
Final rept.,
by Leonard B. Gardner, Alfred E. Hanna, and Henry E.Stanton. 8 Sep 65. 11p. Rept. no. TN-N-726
Proj. Y F015 12 04 406

Unclassified report

Descriptors: (*Radioactive isotopes, Nuclear industrial applications), (*Nuclear industrial applications, Naval shore establishments), Materials, Measurement, Concrete, Density, Soils, Asphalt, Metals, Structural properties

Techniques employing radioisotopes were investigated in order to determine their usefulness to Public Works Departments of the Naval Shore Establishment. These techniques include: absorption, detection of location, and backscattering. The last mentioned seemed to be the most promising and offered several applications for waterfront maintenance. Several Naval Field Establishments were visited during the course of the work to ascertain problem areas. (Author)

18/3. NUCLEAR EXPLOSIONS

AD-621 127 Div. 20/7 ,20/3 ,18/1
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
NEUTRON-FIELD AND INDUCED-ACTIVITY MEASUREMENTS-OPERATION BREN.
by F. M. Tomnovec, and J. M. Ferguson. Sep 65. 44p.
CEX . 62.50

Unclassified report

Descriptors: (*Nuclear explosions, Simulation), (*Air burst, Simulation), (*Neutron activation, Measurement), Gold, Manganese, Sulfur, Cadmium, Soils, Radioactivity, Nuclear reactors

Operation BREN (Bare Reactor Experiment, Nevada) was an experiment that used a 1500-ft tower and a bare (no shielding) fast nuclear reactor patterned on 'Godiva' to simulate a nuclear weapon detonated at various heights above the ground. Certain characteristics of the neutron field from this unshielded reactor were measured. The activation of gold, manganese, sulfur, cadmium-covered gold, and cadmium-covered manganese was determined as a function of distance from the reactor and of depth in the ground. The data show how those parameters, important for calculating neutron-induced activity in the soil, vary as a function of the height of the source and the slant range from the source. (Author)

18/4. NUCLEAR INSTRUMENTATION

AD-620 821 Div. 20/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR MEASURING THE DURATION OF PULSE FRONTS IN TIME INTERVALS,
by M. M.-N. Vidershain. 13 Aug 65. 7p. Rept. no. FTD-TT-65-641
TT . 65-63864

Unclassified report

Unedited rough draft trans. of Russian Patent 166 757, pub. 24 Aug 63, appl. 853979/26-9. 2p.

Descriptors: (*Time-to-pulse-height converters, Transistors), (*Transistors, Time-to-pulse-height converters), (*Time, Measurement), Diodes (Semiconductor), Triodes, Counting methods, Transformers, Feedback, USSR, Patents

Object of the Invention: A device for measuring the duration of fronts and intervals of time which contains a converter of the measurable interval into a pulse, the length of which is equal to the measurable interval, a pulse expander, a counter of the number of pulses developed by a standard generator during the time of the action of the pulse obtained on the output of the pulse expander which has the distinguishing feature that for the purpose of improving the precision of the measurement of short, for example, nanosecond intervals of time, as a pulse expander there is used a semiconductor triode with a circuit transformer feedback into which there is connected a collector-emitter transition (shunt) of a semiconductor triode, and the source of the pulses converted as to length is joined through a semiconductor diode with the base of an auxiliary triode. (Author)

AD-620 882 Div. 20/6 ,2/1
CFSTI Prices: HC $1.00 MF $0.50
ROCHESTER UNIV N Y DEPT OF PHYSICS AND ASTRONOMY
A SPARK CHAMBER EXPERIMENT ON COSMIC GAMMA RAYS,
by R. Cobb, J. G. Duthie, and J. Stewart. 1965, 18p. Rept. no. URPA-94

Unclassified report

Descriptors: (*Cosmic rays, Gamma rays), (*Gamma counters, Cosmic rays), Cosmic ray telescopes, Nebulae, Scintillation counters, Astrophysics, Interstellar matter

The intensity and distribution of high-energy cosmic gamma rays and their importance in astrophysics are discussed. Experimental techniques for obtaining data are explained.

AD-620 997 Div. 20/6
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
DEVICE FOR RECORDING GAMMA TOPOGRAMS,
by E. Yu. Elkind, and V. L. Krivoshein. 29 Jun 65, 8p. Rept. no. FTD-TT-65-209 TT . 65-63922

Unclassified report

Unedited rough draft trans. of Patent (USSR) 162 896, appl. no. 848948/31-16, 25 Jul 63.

Descriptors: (*Gamma counters, Recording systems), Scintillation counters, Relays, Amplifiers, Count-rate meters, Patents, USSR

A device is proposed for recording gamma topograms which contains a scintillation pickup, a linear amplifier, a single-channel amplitude analyzer, a counting-speed meter, a system of control of the scintillation pickup, and a recording device, the distinguishing feature of which is that for the purpose of increasing the clearness of the 'scentigrams' and reducing the overall time of scanning by automatic regulation of the scanning step, in the apparatus there is included a relay-threshold electrical scheme which converts electrical pulses coming from a counting-rate meter into command signals to a system which decreases the scanning step in the passing of the scintillation pickup over the area with increased accumulation of radioactivity. (Author)

AD-621 120 Div. 20/6
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
DIGITAL COMPUTER AUTOMATION OF WHOLE-BODY RADIO-ISOTOPE DETERMINATION.
Master's thesis,
by Frank Stanley Dombek. Aug 65, 91p. Rept. no. GNE/Phys-65-4

Unclassified report

Descriptors: (*Whole body irradiation, Analysis), (*Gamma-ray spectra, Analysis), (*Digital computers, Spectrum analyzers), Programming (Computers), Least squares method, Dosimeters, Radiation measurement systems, Radioactive isotopes

The digital computer, automatic unscrambling of the gamma-ray spectra from a whole-body counter is accomplished by a Fortran II computer code suitable for the IBM-1620 or similar machines. The code is designed for specific use with the USAF Radiological Health Laboratories' whole-body counting facility but might be used in any similar spectral analysis operation. The USAF facility is described. The code will determine relative intensities of any eight or less internal emitters in a complex spectrum, so long as the separate spectra of these emitters are contained in the input. The reduction of the complex spectra is accomplished by the LeastSquares method. Application of the code to sample spectra of known isotopic compositions for dosed phantoms and invivo human testing yields maximum errors of the order of three to four percent with respect to peak analysis methods. (Author)

AD-621 270 See Fld. 9/2

AD-621 299 Div. 20/6 ,20/2 ,30/3
HARVARD UNIV CAMBRIDGE MASS CYCLOTRON LAB
USE OF A LARGE GAP SPARK CHAMBER IN AN INTENSE BEAM OF PARTICLES,
by T. M. Knasel, J. K. Walker, and M. Wong. 13 Nov 64, 2p.

Unclassified report

Pub. in Review of Scientific Instruments v36 n3 p2701 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Charged particles, Radiation measurement systems), (*Radiation measurement systems, Charged particles), Proton beams, Neon, Helium, Argon

An application is considered where a beam of charged particles is passed through a large gap spark chamber. It is shown that the use of helium gas contained in a thin plastic bag in the region of the beam can reduce the efficiency of the spark chamber, in that region, to as little as 0.000001 or less. The efficiency for track detection outside this region is maintained at 100% with the use of a gas mixture of 89% neon, 10% helium, and 1% argon. (Author)

AD-621 312 See Fld. 18/8

AD-621 388 See Fld. 18/2

AD-621 441 See Fld. 18/8

AD-621 565 See Fld. 18/8

18/8. RADIOACTIVITY

AD-620 952 See Fld. 4/2

AD-621 049 See Fld. 20/12

AD-621 123 See Fld. 18/9

AD-621 127 See Fld. 18/3

AD-621 206 See Fld. 9/1

AD-621 308 See Fld. 20/6

AD-621 312 Div. 20/3 ,20/6
CFSTI Prices: HC $3.00 MF $0.75
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
GAMMA-EMISSION DATA FOR THE CALCULATION OF EXPOSURE RATES FROM NUCLEAR DEBRIS. VOLUME II. INDUCED ACTIVITIES,
by G. R. Crocker, and D. T. Wong. 13 Aug 65, 84p. Rept. no. USNRDL-TR-888
Contract AT49 7 1963

Unclassified report

Descriptors: (*Gamma emission, Nuclear explosions), (*Nuclear explosions, Radioactive fallout), Gamma rays, X rays, Beta particles, Dose rate, Abundance, Decay schemes, Artificial radioactivity, Photons, Fission products, Fission product activity

Photon energies and photon abundances were compiled and summarized from some induced activities which may result from nuclear events. The data are presented in tabular form, including photon energies and abundances for the gamma rays, X rays, and beta particles emitted for disintegration. A list of multipliers is also presented for converting activities of the radionuclides to infiniteplane exposure rates. (Author)

AD-621 441 Div. 20/3 ,20/6 ,30/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
MONTE CARLO CALCULATIONS OF GAMMA-RAY ALBEDO.
Technical note.
by Charles M. Huddleston, and Nathan F. Shoemaker, 7 Sep 65, 10p. Rept. no. TN-N-764
Proj. Y F008 08 05 201

Unclassified report

Descriptors: (*Health physics, Monte Carlo method), (*Monte Carlo method, Gamma-ray spectroscopy), (*Gamma-ray spectroscopy, Monte Carlo method), (*Albedo, Gamma rays), Gamma-ray scattering, Concrete, Mathematical analysis, Programming (Computers), Nuclear physics, Shelters

A Monte Carlo computer program has been used to generate values for the differential dose albedo of gamma rays on concrete. The values have been fit to a semiempirical formula containing two adjustable parameters. Values for the parameters are reported as a function of gamma-ray energy. (Author)

AD-621 549 See Fld. 9/1

AD-621 565 Div. 20/3 ,2/7 ,20/6
CFSTI Prices: HC $1.00 MF $0.50
NAVAL RESEARCH LAB WASHINGTON D C
FILTER PACK TECHNIQUE FOR CLASSIFYING RADIOACTIVE AEROSOLS BY PARTICLE SIZE. PART IV. MATHEMATICAL CONSIDERATIONS.
Interim rept.,
by Robert M. Mason, Peter C. Ryan, and Sarah L. Hill. 9 Aug 65, 11p. Rept. no. NRL-6306
Contract AT49 7 2435 Proj. RR004 02 42 5151,RR009 03 45 5802

Unclassified report

See also AD-620 354.

Descriptors: (*Radioactivity, Particle size), (*Fission products, Airborne), (*Aerosols, Radioactivity), (*Radioactive fallout, Classification), Mathematical analysis, Algebra, Linear programming, Programming (Computers), Gas filters, Collecting methods, Air pollution, Nuclear explosions, Radiochemistry, Radioactive isotopes, Atmosphere, Distribution

Passing an air stream through a sequence of filters having different retentivities effects some classification of radioactive particles by size. Airborne radioactivity has been related to particle size by a system of four simultaneous linear algebraic equations in four unknowns. Each equation expresses the total radioactivity collected on a given filter in terms of the total activity for each size group and the probability for particles of that group being trapped on that filter. A preliminary set of filter pack collection data was used to determine a coefficient matrix for the system based on these probabilities. The system was then applied to new data. This procedure can be applied to a variety of filter pack constructions for relating other characteristics of atmospheric particles to particle size. (Author)

18/9. REACTOR ENGINEERING AND OPERATION

AD-620 828 Div. 20/5 ,30/2
CFSTI Prices: HC $6.00 MF $1.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
SURFACE TEMPERATURE CALCULATIONS FOR THE AF NETR.
Master's thesis,
by Gerald McGovern. Aug 65, 239p. Rept. no. GNE/ME/65-2

Unclassified report

Descriptors: (*Test reactors, Air Force), (*Surface temperatures, Determination), (*Programming (Computers), Surface temperatures), Heat transfer, Reactor fuel plates

A three-dimensional computer program, TEMP, was developed to calculate the fuel plate surface temperature distribution in the Air Force Nuclear Engineering Test Reactor (AF NETR) under steady state conditions. Approximate equations, which could be solved directly, were written to calculate the surface temperatures of the fuel plates and the bulk water temperatures. Analysis of the equations showed good agreement with results from more exact energy balance equations, which consisted of a set of simultaneous linear algebraic equations. A separate computer program, HEAT, was developed to synthesize three-dimensional heat generation data from various two-dimensional neutron source distributions produced by the neutron diffusion code, PDQ-2. TEMP is written in FORTRAN IV language for the IBM 7094 direct-couple or stand-alone system. Using threedimensional heat generation input data, it calculates the surface temperatures at a variable number of points, up to 75 across the core and up to 50 points in the vertical direction, along the centerline of each row of elements. (Author)

AD-620 864 **See Fld. 20/8**

AD-621 002 **See Fld. 20**

AD-621 021 Div. 20/5 ,21/5 ,30/2
FSTI Prices: HC $4.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
MULTI-GROUP DISCRETE SN TRANSPORT CALCULATION FOR CYLINDRICAL GEOMETRY.
Master's thesis,
by Ronald M. Saqui. May 65, 115p. Rept. no. GNE/Phys-65-17

Unclassified report

Descriptors: (*Programming (Computers), Neutron transport theory), (*Neutron transport theory, Programming (Computers)), (*Rocket propulsion, Nuclear reactors), Nuclear propulsion, Cylindrical bodies, Numerical analysis

A computer code is presented for neutron transport calculations on a cylindrical geometry, gaseous core, nuclear rocket. The code is applied to a simplified reactor system model consisting of a two region right cylindrical cavity core with an effective temperature of 3980K. The calculations are performed using a five energy group, discrete S4 approximation of the Boltzmann Equation. The cylindrical form of the Boltzmann Equation is developed in detail. Application of the discrete Sn approximation to obtain the finite difference equations and the boundary conditions is shown. An iterative procedure having the total fission source production as the eigenvalue is used by the computer code to solve these equations numerically. This code is written in Fortran IV language for the IBM 7094 coupled system. The atom density results of the two systems tested are within 2.5% and 0.6% agreement with those of another code written by T. F. Plunckett of Douglas Aircraft. Although these results are good, variations in the multiplication factor and the inability to significantly effect this factor by small changes in system parameters leads to the conclusion that further tests of the code are required before it may be used in the analysis of the propulsion device. (Author)

AD-621 026 Div. 20/5
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
DETERMINATION OF THE THERMAL NEUTRON FLUX DISTRIBUTION IN A HEXAGONAL LATTICE CELL.
Master's thesis,
by Paul Byron Fleming. Aug 65, 157p. Rept. no. GNE/Phys-65-6

Unclassified report

Descriptors: (*Neutron flux, Reactor lattice parameters), (*Reactor lattice parameters, Numerical analysis), Thermal neutrons, Neutron transport theory, Partial differential equations, Reactor cores, Programming (Computers)

Thermal neutron flux distributions were obtained in hexagonal and square lattice cells by a finite difference approximation to the diffusion equation. The grid network used to approximate the lattice cells was created from a combination of cylindrical and cartesian coordinate systems to facilitate the handling of the normal boundary conditions at the rod surface. Square lattice cell flux distributions for non absorbing media compare favorably to those predicted in an analytic solution by Cohen. Marked deviations in this result occur as absorption is increased. Hexagonal and square cell flux distributions agreed within 1.5 per cent to the results predicted by the cylindricalization technique at interior points in the cell for all cases of absorption studied. Large deviations in flux distributions along the cell boundaries indicate that errors may arise in calculations of the thermal utilization based upon the cylindricalization assumption. Deviations in all results near the rod surface are attributed to truncation error or normalization technique. (Author)

AD-621 097 **See Fld. 20**

AD-621 118 Div. 20/5
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
FUEL BURNUP STUDIES OF THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY.
Master's thesis,
by Max Forest Thompson,Jr.. Jun 65, 185p. Rept. no. GNE/Phys/65-19

Unclassified report

Descriptors: (*Reactor fuels, Consumption), Reactor cores, Fission, Programming (Computers), Neutron cross sections

To study the effect of fuel burnup on the Air Force Nuclear Engineering Test Facility (AF-NETF) a new code, called Twenty Grand Burnup, was developed. The purpose of the report is to discuss the theory and the code as well as the results of the calculations of fuel burnup.

AD-621 119 **See Fld. 20/8**

AD-621 121 Div. 20/5 ,20/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A TRANSPORT CALCULATION OF THE FLUX IN THE NUCLEAR ENGINEERING TEST REACTOR TEST-CELLS.
Master's thesis,
by Lee Haltom Livingston. Jun 65, 78p. Rept. no. GNE/PHYS-65-10

Unclassified report

Descriptors: (*Test reactors, Neutron transport theory), (*Neutron transport theory, Test reactors), (*Nuclear engineering, Test reactors), Neutron flux, Thermal reactors, Nuclear cross sections, Integral equations, Programming (Computers)

This report describes a calculation of the neutron flux in the test-cells using the discrete S sub n approximation to the transport equation in xy-geometry. The calculation was done by writing a computer program, S4C40, for the IBM 7094 using three energy groups and 1600 mesh points. Fast cross-sections were generated with the General Atomics code GAM-I, and thermal cross-sections were calculated by hand assuming a Maxwell-Boltzmann distribution. The results, which were compared with the multigroup, two-dimensional diffusion theory code PDQ, show a significantly higher thermal flux over the entire reactor and a more slowly decreasing flux for all groups in the test-cell. (Author)

AD-621 123 Div. 20/5 ,20/3 ,25/8
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
THE CONSTRUCTION AND INSTRUMENTATION OF A CRYOSTAT FOR THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY.
Master's thesis,
by Karl D. McAllister. Aug 65, 93p. Rept. no. GNE/Phys-65-4-A

Unclassified report

Descriptors: (*Cryostats, Nuclear physics laboratories), (*Nuclear physics laboratories, Cryostats), (*Nuclear engineering, Test facilities), Cryogenics, Liquefied gases, Helium, Shielding, Reactor theory

The object of this study was the construction and instrumentation of the cryostat designed by Captain Ernie Braunschweig (AFIT GNE-64 Thesis). The cryostat and associated helium supply systems were constructed. Instruments were designed to measure the various parameters of the experiments to be conducted with the cryostat. Instruments to measure temperature and liquid level have been constructed and tested. Biological shielding for use with the cryostat, in the reactor, has been designed. Some changes in the design were incorporated because of available fabrication techniques. (Author)

AD-621 124 Div. 20/5
CFSTI Prices: HC $6.00 MF $1.25
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A KINETIC ANALYSIS OF THE AIR FORCE NUCLEAR ENGINEERING TEST REACTOR.
Master's thesis,
by John Arnold Palmer. Aug 65, 205p. Rept. no. GNE-65-16

Unclassified report

Descriptors: (*Test reactors, Reactor kinetics), (*Air Force research, Test reactors),

(*Nuclear engineering, Test reactors), (*Reactor kinetics, Test reactors), Reactor theory, Mathematical models, Neutron flux, Programming (Computers), Nuclear physics laboratories

A series of parametric relationships are derived which predict the kinetic behavior of the Air Force Nuclear Engineering Test Reactor. These parametric relations are based both on the reactor's physical design and its calculated nuclear constants. The analytical model chosen was based heavily on experimental and theoretical results from the SPERT I and IV test series. Neutron kinetics were described using the space independent kinetics equations with six delayed groups. Thermal kinetics were obtained by breaking the reactor cooling system into a series of blocks and writing a heat balance equation for each. Reactivity feedback was based on an effective void volume due to moderator density change, core expansion, and steam formation. A digital computer code was constructed to solve the resulting set of differential equations. The theory was checked by inserting nuclear and physical characteristics of the SPERT IV reactor facility into the code. Time-dependent plots of power, temperature and reactivity which compared favorably with experiment resulted. A series of parametric power and temperature curves was then obtained for the NETR by varying void coefficient, delayed fraction, generation time, and metal-water ratio, for various step inputs of reactivity. (Author)

AD-621 201 See Fld. 12/1

AD-621 269 Div. 20/5 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
NEUTRON TRANSPORT CALCULATIONS OF THE AIR FORCE NUCLEAR ENGINEERING TEST FACILITY CORE.
Master's thesis,
by Donald Lloyd Norman. Aug 65, 61p. Rept. no. GNE/Phys/65-14
Unclassified report

Descriptors: (*Neutron transport theory, Test reactors), (*Test reactors, Air Force), (*Reactor cores, Test reactors), Nuclear engineering, Thermal reactors, Neutron flux, Reactor theory, Programming (Computers)

The neutron flux in segments of the core of the Air Force Nuclear Engineering Test Reactor was investigated using transport theory. Two portions of the core were treated; the fuel plates and the control rods. These regions were represented as a one-dimensional array of thin slabs. A matrix collapsing technique for the solution of many-region, slab-geometry problems using the P-3 approximation was developed and a computer code to make the calculations was written. It was determined that no flux weighting was necessary in calculating homogeneous cross sections for the fuel regions. A technique was developed to compute a simplified control rod model, but computing difficulty prevented its being tested. (Author)

AD-621 455 See Fld. 12/1

AD-621 473 See Fld. 20/8

AD-621 513 See Fld. 20/8

AD-621 542 See Fld. 9/2

AD-621 594 See Fld. 20

19/1. AMMUNITION, EXPLOSIVES, AND PYROTECHNICS

AD-620 984 Div. 22/1 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
RELIABILITY CONCEPTS IN THE HERO PROGRAM,
by Russell N. Skeeters. Aug 65, 11p. Rept. no. NOTS-TP-3895
NAVWEPS , 8794
Unclassified report

Descriptors: (*Electromagnetic shielding, Weapons), (*Weapons, Electromagnetic shielding), (*Reliability, Electromagnetic shielding), Hazards, Explosives iniators, Suppressors, Radiofrequency, Radiation hazards, Explosive materials, Ordnance, Aircraft

The report examines the basic philosophy, general objectives, and definition of tasks of the HERO program. It is believed that efforts to solve the HERO problem have been stultified by adherence to a doctrine of absolutism in which HERO has been regarded more as a safety program than a means for contributing to the Navy's mission. The report emphasizes the importance of reliability concepts for the stated objectives, and proposes a breakdown of the general problem into four phases, together with a realignment of responsibilities based on this division. (Author)

AD-621 164 Div. 22/1
CFSTI Prices: HC $1.00 MF $0.50
HOLMAN (JOHN F) CO INC WASHINGTON D C
THE BEHAVIOR OF PRIMARY EXPLOSIVES I. THE THERMAL DECOMPOSITION OF MERCURY FULMINATE,
by Kazumoto Yamamoto. Sep 65, 23p. Contract DA44 009AMC930T Proj. 1C014501A32B
AERDL ,TT T-1801-65; ,65-63957
Unclassified report

Trans. of Kogyo Kayaku Kyokaishi (Japan) v24 n5 1963.

Descriptors: (*Explosives initiators, Chemical properties), (*Mercury compounds, Fulminates), (*Fulminates, Decomposition), Explosive materials, Pyrolysis, Japan

AD-621 448 See Fld. 19/4

AD-621 563 See Fld. 19/4

19/4. EXPLOSIONS, BALLISTICS, AND ARMOR

AD-620 835 See Fld. 20/3

AD-621 246 Div. 22/2
CFSTI Prices: HC $6.00 MF $1.25
ARMY NATICK LABS MASS
ARMOUR MATERIALS RESEARCH. PART I. PROCEEDINGS OF A MEETING OF ARMOR MATERIALS RESEARCH CONTRACTORS 19-20 MAY 1964.
Technical rept.
Aug 65, 218p. Rept. no. TR-C and OM-5
Unclassified report

Descriptors: (*Armor plate, Penetration), (*Penetration, Armor), (*Armor, Impact (Shock)), (*Materials, Armor), Laminates, Terminal ballistics, Textiles, Fibers (Synthetic), Polymers, Plastics, Ceramic materials, Body armor, Mechanical properties, Optical properties, Mechanics

Contents: Theoretical studies on the mechanics of penetration of single and laminated metallic plates by cylindrical projectiles, A theoretical study of low velocity penetration phenomena, Ballistic penetration of organic fibre felts, High speed impact of textiles, Study of the phenomenon of cold drawing (plastic yield) in high polymers, Preliminary investigation of mechanical and optical response of polymers to impact, Evaluation of ceramics for personnel protection.

AD-621 448 Div. 22/6 ,22/1
CFSTI Prices: HC $3.00 MF $0.75
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
PRELIMINARY ONE-DIMENSIONAL INVESTIGATION OF THE INITIATION OF LOW-DENSITY PETN BY HYDROGEN-OXYGEN DETONATION WAVES,
by A. H. Makomaski. Feb 65, 57p. Rept. no. UTIAS-TN-83
Contract AF33 657 7874
Unclassified report

Descriptors: (*PETN, Detonations), Hypervelocity guns, Detonation waves, Hydrogen, Oxygen, Containers, Deformation, Velocity, Steel, Combustion, Density, Ignition, Shock waves, Shock tubes, Deflagration, Canada

Various aspects of the problem of initiation of a uniform layer of PETN by head-on collisions of plane hydrogenoxygen detonation waves are considered. It was found that low-density (1 gm/cc and 0.87 gm/cc) disc pressings of PETN 1.5 in. dia. x 0.15 in. thick consistently appeared to detonate when the initial pressure of the stoichiometric hydrogen-oxygen mixture was about 13 atm or more and the length of the detonation tube was approximately 4 in. Detonation of the PETN was inferred from the deformation of the steel containers which held the pressings rather than from a direct measurement of detonation velocity in the pressing. It was not possible to verify in these tests whether the detonations were of high order. (Author)

AD-621 563 Div. 22/4 ,22/1 ,9/6
CFSTI Prices: HC $1.00 MF $0.50
BALLISTIC RESEARCH LABS ABERDEEN PROVING GROUND MD
THE ACCURACY OF DRAG MEASUREMENTS AS A FUNCTION OF NUMBER AND DISTRIBUTION OF TIMING STATIONS,
by B. G. Karpov. Feb 48, 23p. Rept. no. BRL-658
Unclassified report

Descriptors: (*Drag, Measurement), (*Projectiles, Drag), Mathematical analysis, Time, Distribution, Errors, Functional analysis, Optimization

General formulae are given for the error to be expected in the drag coefficient of a projectile whose flight is observed over a given range containing n timing stations distributed in an arbitrary manner. It is assumed that the time-distance relation can be represented by a cubic polynomial of the form t = a0 + a1z + a2z squared + a3z cubed. It is further assumed that the mean errors in time and distance are independent and constant at each observing station. Illustrative examples are included. A proof of optimum distribution of timing stations for drag determination is given. (Author)

19/5. FIRE CONTROL AND BOMBING SYSTEMS

AD-621 452 See Fld. 16

19/8. UNDERWATER ORDNANCE

AD-621 339 See Fld. 15/3

20. PHYSICS

AD-621 002 Div. 20/9 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE MICROTRON AND ITS AREAS OF APPLICATION,

by S. P. Kapitsa. 18 Jun 65, 19p. Rept. no. FTD-TT-65-658
TT, 65-63927

Unclassified report

Unedited rough draft trans. of Atomnaya Energiya (USSR) v18 n3 p203-9 1965, See also AD-610 931.

Descriptors: (*Electron accelerators, Cyclotrons), (*Cyclotrons, Electron accelerators), Electron beams, Particle trajectories, Radiation chemistry, USSR

A review is given of the basic results obtained in the study and development of a microtron with a large beam current. Comparison is made between this new type of electron accelerator and other electron accelerators of average energy. Areas of application of the microtron in various scientific and technical areas are briefly considered. (Author)

AD-621 097 Div. 20/9 ,20/5 ,30/3
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
ELECTRONIC SERVO FOR SYNCHROTRON INJECTION TIME CONTROL,
by C. P. Wang. 24 Feb 64, 2p.

Unclassified report

Pub. in The Review of Scientific Instruments v35 n11 p1492-3 Nov 64 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Synchrotrons, Servomechanisms), (*Servomechanisms, Synchrotrons), Timing circuits, Time-topulse-height converters, Time-delay relays, Time switches

An electronic servo was developed for injection time control of an electron synchrotron. It consists of a delay time command, an error detector, an integrator, an adder, a variable time delay unit, and a time-to-pulse-height converter. The servo works with electric potential analog and contains no mechanical movable parts except the delay time command Helipot. Timing errors of the controlled system (the thyratron pulsing the synchrotron injector, together with its trigger circuit) are converted into error voltage pulses and applied to the time delay unit for selfcorrection. The time-height converter is sensitive to letter than 1 part in 5000. This and the double-forwardpath control introduced make the regulated output extend from 3.5 to 8.5 microsec, and zero nsec error for steady timing errors in the controlled system and 10 nsec error for random fluctuations. The servo was built with transistors and was temperature compensated. The temperature stability is better than 5 nsec/degree C. (Author)

AD-621 594 Div. 20/9 ,20/5 ,8/1
CALIFORNIA INST OF TECH PASADENA
BEAM CURRENT INTEGRATION OF HEAVY ION PROJECTILES,
by H. M. Loebenstein, D. W. Mingay, and C. S.Zaidins. 30 Jan 65, 2p. Contract Nonr22047

Unclassified report

Pub. in Nuclear Instruments and Methods v33 p175-6 1965 (Copies available only to DDC users).

Descriptors: (*Ionic current, Ion accelerators), (*Integrators, Ionic current), Ion beams, Electric currents, Secondary emission

20/1. ACOUSTICS

AD-620 842 Div. 25/1 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
HARMONIC GENERATION OF MICROWAVE PHONONS,
by Paul H. Carr. 1965, 20p.

Unclassified report

Descriptors: (*Phonons, Microwave frequency), (*Sound generators, Microwave frequency), Harmonic oscillators, Mechanical waves, Dielectrics, Acoustic equipment, Quartz, Cryogenics

The ability to produce coherent phonons of microwave frequency provides a much needed means of investigating fundamental phenomena in solid state physics at frequencies never before attained. It is shown for the first time that second and third harmonics of the fundamental acoustic wave are also generated. The fact that the secondharmonic acoustic power was observed to be proportional to the square of the fundamental and the third-harmonic acoustic power proportional to the cube of the fundamental establishes the nonlinearity of the generation mechanism. Second-harmonic generation of longitudinal phonons in nonpiezoelectric Z-cut quartz was observed. The generation mechanism is common to all dielectric media. This demonstrates that coherent phonon generation is not restricted to relatively rare piezoelectric materials. The highest frequency at which microwave phonons can be generated is limited to 80 Gcps by present-day highpower microwave sources. The successful generation of harmonics of microwave phonons enhances the possibility of extending the present limit well into the millimeter range. Fundamental research of this type can lead to such practical control devices as microwave delay lines since the acoustic delay time of one centimeter of quartz is the same as that of 500 meters of waveguide. (Author)

AD-620 854 **See Fld. 9/1**

AD-621 005 **See Fld. 20/12**

AD-621 034 **See Fld. 20/3**

AD-621 125 Div. 25/1
CFSTI Prices: HC $4.00 MF $0.75
NAVAL RESEARCH LAB WASHINGTON D C
A REVIEW OF WORLD CONTRIBUTIONS FROM 1945 TO 1965 TO THE THEORY OF ACOUSTIC RADIATION. CHAPTER II. THREE-DIMENSIONAL HARMONIC RADIATION,
Interim rept.,
by S. Hanish. 6 Aug 65, 121p. Rept. no. 1636
Proj. ONR RF001 03 05

Unclassified report

Descriptors: (*Acoustics, Harmonic oscillators), Sound transmission, Acoustic properties, Mechanical waves, Numerical methods and procedures, Spheres, Bodies of revolution, Reviews

Contents: The n'th Order Spherical Radiator; Acoustic Intensity and Acoustic Power of Spherical Radiators; Radiative Capacity of the n'th Order Spherical Radiator; Increment of Mass and Accession of Inertia For Spherical Radiators; Near Field and Far Field of Spherical Radiators; Acoustic Power from Point Sources - from One Spherical Cap - From Two Spherical Caps of Opposing Velocity at the Poles of a Spherical Radiator; Acoustic Radiator From a Zonal Radiator on a Spherical Baffle; The Spheroidal Wave Field; Zonal Radiators on Spheroids; The Radiation of Sound in the Limit of High Frequencies - The Geometric Case; The Radiation of Sound in the Limit of High Frequencies: the Geometric Case Plus Terms of Higher Order; Radiation From a Surface of Revolution, Numerical Procedure of Chertock; Calculation of the Radiation of Sound From a Surface of Revolution By the Method of Copley; Empirical Analysis of 3-Dimensional Steady State Fields by the Method of Pachner.

AD-621 130 **See Fld. 20/12**

AD-621 161 Div. 25/1
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF RESEARCH LABS
SOUND-WAVE FLUCTUATIONS IN AN ENVIRONMENT OF SIMULATED RANDOM INHOMOGENEITY,
by G. C. Knollman, and J. J. Hartog. 29 Mar 65, 6p.

Unclassified report

Pub. in the Acoustical Society of America, v38 n1 p72-7 Jul 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sound transmission, Underwater sound), (*Underwater sound, Sound transmission), (*Acoustics, Underwater sound), Mechanical waves, Propagation, Ultrasonic rqdiation, Spheres, Refractive index

A research program has been conducted under controlled laboratory conditions of acoustic amplitude fluctuations arising during sound transmission through an underwater medium containing a spatially random distribution of inhomogeneities that are temporally stationary. Spherical, thin-walled, liquid-filled balloons of a diameter large in comparison with the acoustic wavelength were situated at random in a large underwater facility. Refractive indices of the fluid spheres were varied up to 1% from the index for water. Thus, numerous weak, large-scale refractiveindex variations were introduced in an experimental acoustic chamber under controlled temperature conditions. Signal fluctuations were measured in plane-wave sound transmission through the simulated random environment for four different ultrasonic frequencies and four transmitter-to-receiver ranges. Multiudinous ensembles were realized at each frequency and range by rotation of transmitter-receiver line of sight about its midpoint. The experimental arrangement and measurement procedures are detailed herein, and mean-square amplitude fluctuations that were determined are presented as a function of both acoustic frequency and transmitter-to-receiver range. Theoretical results for plane-wave propagation in a statistically isotropic medium are included as a foundation for the laboratory findings. (Author)

AD-621 313 **See Fld. 20/2**

AD-621 372 **See Fld. 17/2**

AD-621 475 Div. 25/1 ,30/3
CFSTI Prices: HC $2.00 MF $0.50
AMERICAN ELECTRONIC LABS INC COLMAR PA
HYDROACOUSTIC VELOCIMETER SYSTEM.
Final rept.
Aug 65, 28p. Contract Nonr411300

Unclassified report

Descriptors: (*Underwater sound equipment, Meters), (*Sound, Velocity), Sea water, Transducers, Acoustic equipment, Quartz, Measurement

The highly accurate acoustic velocimeter was designed to measure the velocity of sound in seawater, under laboratory conditions, at pressures up to 10,000 psi with an accuracy of (one one-hundredth of one percent). This velocimeter is ultimately intended as a standard device for calibrating other velocimeters. The following techniques comprise the basis of this system: (1) single-harmonic test signal method: the phase-difference changes of a high-frequency test signal (25 Mc) are observed and recorded while the distance between two transducers is changed by a known, precise amount and (2) Transient test signal method: a transducer is shock excited by a very short electrical pulse, and the propagation time of the wavefront to a second transducer, a known distance from the first, is determined. Use of the two methods results in a selfchecking system. Agreement of the results of the two methods confirms the precision of the measurement.

AD-621 561 **See Fld. 20/4**

20/2. CRYSTALLOGRAPHY

AD-620 865 See Fld. 20/3

AD-620 889 See Fld. 20/12

AD-620 890 See Fld. 20/12

AD-620 901 Div. 25/2 ,4/2
CFSTI Prices: HC $1.00 MF $0.50
METCALF RESEARCH LAB BROWN UNIV PROVIDENCE R I
X-RAY STUDIES OF SIMPLE CRYSTALS.
Periodic status repts. no. 45-49 (final), 1 Sep 6330 Nov 64,
by Gene B. Carpenter. 15 Mar 65, 3p. Contract Nonr56204

Unclassified report

Descriptors: (*Crystals, X-ray diffraction analysis), Crystal structure, Tellurium compounds, Nitrates, Carbon compounds, Bromides, Cesium compounds, Iodine compounds, Complex compounds, Chlorides, Nickel compounds, Chemical bonds

The determination of the structure of Te2O4-HNO3 was completed. A complicated network of linked Te and O atoms runs through the crystal in a pattern similar to that shown by the oxide TeO2. A study of both the high- and low-temperature forms of carbon tetrabromide was initiated in an attempt to learn more about the nature of the transition. The high-temperature form is supposed to have extensive disorder, and the x-ray diffraction pattern fades out rapidly with increasing angle. The low-temperature form has a rather large unit cell. Cs12Br. was studied. The structure was completely determined. The nearly linear 12Br (-) anion has bond lengths I-I = 2.78 and I-Br = 2.91 A, rather similar to the dimensions in the isomorphous compound Cs13. Ni (etu)4C12 was studied. Two crystal forms of this ethylenethieurea (etu) complex was prepared and studied. It is suggested that one form has the chlorine ligands in the cis configuration, the other trans.

AD-620 968 Div. 25/2 ,17/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
JOURNAL OF PHYSICS (SELECTED ARTICLES).
25 Jun 65, 21p. Rept. no. FTD-TT-64-1010 TT , 65-63909

Unclassified report

Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v17 n9 p439-44, 445-9 1961.

Descriptors: (*Single crystals, Metals), (*Metals, Single crystals), Crystal growth, Impurities, Copper, Cobalt, Silver, Iron, Microstructure, Crystal lattice defects. Hardness, Rupture, Tensile properties, China, Fiber metallurgy

Contents: Growth and strength of metal whiskers containing impurities, Metallographic observations and hardness measurements on mixed metal whiskers.

AD-621 036 See Fld. 20/12

AD-621 038 See Fld. 20/12

AD-621 051 See Fld. 11/6

AD-621 076 Div. 25/2 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
ECOLE NORMALE SUPERIEURE PARIS (FRANCE)
INFRARED STUDY OF LOCALIZED VIBRATIONS IN SILICON DUE TO BORON AND LITHIUM.
Scientific rept.,
by M. Balkanski, and W. Nazarewicz. 1965, 34p.
Rept. no. SR-3
Contract AF61 052 789
AFCRL , 65-590

Unclassified report

Descriptors: (*Silicon, Crystal lattice defects), Impurities, Isotope Impurities, Boron, Lithium, Absorption spectrum, Spectra (Infrared), Symmetry (Crystallography), Temperature, Semiconductors, France

Infrared absorption was used to determine the characteristics of localized modes in silicon due to the electrically active impurities, the isotopes of boron and lithium. The impurity and isotopic origin of all peaks was indicated. An attempt was made to deduce the configuration of both impurities in the lattice from the number of observed peaks. The temperature effect on the position, width, and integrated intensity of absorption peaks was measured. The temperature dependence of the position and line width may indicate the role of anharmonic forces around the impurities. The study of the temperature dependence on the integrated absorption is a means for distinguishing the one-phonon absorption caused by other processes.

AD-621 077 See Fld. 11/6

AD-621 218 Div. 25/2 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS
THE INTERACTION OF CHARGE CARRIERS WITH THE CRYSTAL LATTICE.
Final rept.,
by Gerald M. Rothberg. 14 Jun 65, 4p. Contract AF49 638 1018
AFOSR , 65-1562

Unclassified report

Descriptors: (*Phonons, Electrons), (*Electrons, Phonons), (*Thermoelectricity, Germanium), Crystal lattices, Hydrostatic pressure, Thermal conductivity, Semiconductors

The electron-phonon interaction was studied in germanium using the thermoelectric power. It is shown theoretically and experimentally that the energy change of the lattice-electron system contributes to the thermoelectric power. The change in the thermoelectric power produced by hydrostatic pressure is discussed. Preliminary measurements were made on the effect of pressure on tunneling in superconducting films.

AD-621 257 Div. 25/2 ,25/8 ,30/3
BRIGHAM YOUNG UNIV PROVO UTAH DEPT OF PHYSICS
EQUATION OF STATE OF NACl AND ITS USE AS A PRESSURE GUAGE IN HIGH-PRESSURE RESEARCH,
by Daniel L. Decker. 28 Apr 64, 7p. Contract AF AFOSR201 63 Proj. 9763 Task 976301
AFOSR , 65-1374

Unclassified report

Pub. in Journal of Applied Physics v36 n1 p157-61 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Sodium compounds, Chlorides), (*Pressure gages, Salts), Equations of state, Crystal lattices, Pressure, High-pressure research, Thermal expansion

The pressure as a function of lattice parameter and temperature has been calculated for NaCl over a pressure range of 0 to 500 kbar for temperatures between 0 and 1500C. The calculation used the Mie-Gruneisen equation of state with Born-Mayer type repulsion terms between first and second nearest neighbors. The Gruneisen constant was expanded about its value at room temperature and atmospheric pressure; the first coefficient in the expansion being evaluated by forcing the calculated thermal expansion at atmospheric pressure to fit the experimental results of Enck. The two empirical parameters in the repulsion terms were evaluated using the experimental lattice parameter and isothermal compressibility at atmospheric pressure. The calculated pressure vs volume agrees with Bridgman's room-temperature measurements in NaCl below 100 kbar to within 3% and with high-pressure high-temperature shock data to better than 2%. It is proposed to use the numerical results to calibrate the pressure in high-pressure high-temperature apparatus. (Author)

AD-621 309 See Fld. 20/12

AD-621 313 Div. 25/2 ,17/2 ,25/1
UPPSALA UNIV (SWEDEN) DEPT OF PHYSICS
INVESTIGATION OF THE BORDONI PEAK IN GOLD AND OTHER F.C.C. METALS,
by Mervana Mongy. 22 Apr 65, 13p. Contract AF EOAR53 63
AFOSR , 65-1385

Unclassified report

Pub. in Arkiv for Fysik v29 n27 p343-52 10 Mar 65 (Copies available only to DDC users).

Descriptors: (*Gold, Acoustic properties), (*Metals, Acoustic properties), Single crystals, Aluminum, Copper, Silver, Anisotropy, Relaxation time, Ultrasonic radiation, Internal friction, Crystal lattice defects, Sweden, Crystal structure, Absorption

The Bordoni peak has been investigated in the three principal directions bracket 111, bracket 100 and bracket 110 of a single crystal of gold at the frequencies 5, 10, 20 and 45 mc/s. The results confirm the previous measurements on single crystals of aluminum, copper and silver. The activation energy and the relaxation frequency differ much from one orientation to the other and the minimum values are obtained when the ultrasonic waves are applied in the bracket 111 direction. The comparison of the Bordoni peak with Zener's single relaxation theory shows that the peak in the bracket 111 direction is due to a single relaxation process while a spectrum of relaxations is responsible for the peak in the other two directions. The activation energy and the relaxation frequency obtained in the bracket 111 direction are found to be very near to those characterizing the single relaxation peak in copper and silver. The values of (c sub t H/f sub 0 b4 microns) calculated using these activation energies and relaxation frequencies, show that the ratio is invariant in the three metals. This is in agreement with Seeger's model and shows that the theory can only be applied when the peak is due to a single relaxation process.

AD-621 384 Div. 25/2 ,4/3
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
THE CRYSTAL STRUCTURE OF 2- (4'-AMINO-5'AMINO PYRIMIDY) -2-PENTENE-4-ONE.
Physical sciences research papers, (revised ed.),
by J. Silverman, and N. F. Yannoni. 1 Jul 64, 18p. Rept. no. AFCRL-65-545 ,PSRP-121
Proj. 8659 Task 865901

Unclassified report

Pub. in Acta Crystallographica v18 pt.4 p756-64 4 Apr 1965 (Copies available only to DDC users). Revision of manuscript submitted 10 Apr 64.

Descriptors: (*N-heterocyclic compounds, Crystal structure), (*Amines, Crystal structure), (*Ketones, Crystal structure), Crystal lattices, Fourier analysis, Least squares method, Molecular structure, Pyrimidines, Chemical bonds

2- (4'-Amino-5'-amino pyrimidyl) -2-pentene-4-one is an aminopyrimidine derivative with a side chain of seven atoms ortho to the amino group. The compound crystallizes in the monoclinic space group, P2 (1)/c. The unit-cell dimensions are a = 7.024, b = 12.42, c = 12.28 A, beta=108.4 degrees. Patterson map superpositions and Fouri-

er syntheses led to a trial structure. This structure refined to an R index of 12.8% by Fourier and least-squares techniques. 1005 independent reflections were used. The molecule lies in two planes, one containing the ring and the other containing the side chain. The atoms in the pyrimidine ring have small but significant deviations from the least-squares plane passed through the ring. The packing is characterized by an extensive network of hydrogen bonds. Each molecule participates in four hydrogen bonds between amino nitrogen atoms and neighboring ring nitrogen atoms, and two hydrogen bonds between the side chain nitrogen atom and the oxygen atom. The latter bonds appear to be bifurcated intra- and inter-molecular hydrogen bonds. (Author)

AD-621 409 Div. 25/2 ,17/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
THE INSTABILITY OF THE WORK HARDENED STATE. II. SLIP IN 'ALIEN' DISLOCATION DISTRIBUTIONS,
by Z. S. Basinski, and P. J. Jackson. 22 Mar 65, 12p. Rept. no. NRC-8568
Unclassified report

Pub. in Phys. Stat. Sol. v10 n45 p45-56 1965 (Copies available only to DDC users).

Descriptors: (*Crystals, Deformation), (*Crystal lattice defects, Deformation), Canada, Copper, Surface properties, Hardness, Stability

The mechanism of slip in copper crystals with extraneously deformed surfaces was investigated using an etch pit technique. Some suggestions are made as to the deformation of crystals with hard surface layers. Slip in crystals oriented for multiple glide and in polycrystals is also discussed. Experiments of the latent hardening type were carried out on copper crystals by altering the slip system during the course of deformation. Phenomena characteristic of slip in alien dislocation distributions were observed when the slip plane was changed but not when only the slip direction was altered. The stability of Stage II dislocation distributions is discussed in the light of these experiments. It is concluded that the character of slip in Stage II is determined by the geometry of the dislocation distribution. (Author)

AD-621 411 See Fld. 20/12

AD-621 461 Div. 25/2 ,4/2 ,4/4
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
ON THE STRUCTURES OF SOME HYDROXO SALTS OF AL3+, GA3+, IN3+, AND TL3+,
by Georg Johansson. 1963, 24p. Contract AF61 052 162 Proj. 9760 Task 976003
AFOSR , 65-1441
Unclassified report

Pub. in Svensk Kemisk Tidskrift v2 n6-7 p1-22 1963 (Copies available only to DDC users).

Descriptors: (*Crystal structure, Hydroxides), (*Hydroxides, Crystal structure), Aluminum compounds, Gallium compounds, Indium compounds, Thallium compounds, Sulfates, Selenium compounds, Complex compounds, Metals, Ions, Hydrolysis, Sweden

A survey is presented of the crystal structures of some hydroxide sulfates and selenates of Al3+, Ga3+, In3+, and Tl3+. Their relations to other structures, particularly to those of the hydroxides, are discussed and an attempt is made to relate the structures of the metal-oxygen complexes in the solids with the composition of the polynuclear complexes determined from investigations on hydrolyzed solutions. (Author)

AD-621 538 See Fld. 7/3

AD-621 601 Div. 25/2 ,17/2 ,17/7
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
EQUIATOMIC TRANSITION METAL ALLOYS OF MANGANESE. III. THE TETRAGONAL NiMn PHASE,
by W. B. Pearson, Kari Brun, and A. Kjekshus. 20 Nov 64, 8p. Rept. no. NRC-8725
Unclassified report

Pub. in Acta Chemica Scandinavica, v19 n2 p477-84 1965 (Copies available only to DDC users). Prepared in cooperation with Oslo Univ., (Norway).

Descriptors: (*Phase studies, Manganese alloys), (*Manganese alloys, Transition elements), (*Nickel alloys, Manganese alloys), Crystal lattices, Magnetic properties, Density, Crystal structure, Iridium alloys, Low-temperature research, Platinum alloys

Measurements were made of the variation with composition of lattice parameters, density and magnetic susceptibility of the low temperature NiMn phase which has the tetragonal CuAuI-type structure. These are discussed and compared with similar measurements on the PtMn and IrMn phases with the same type of structure. (Author)

AD-621 606 See Fld. 20/12

20/3. ELECTRICITY AND MAGNETISM

AD-620 814 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ABOUT STATES WITH ANISOTROPIC DISTRIBUTION FUNCTION IN RAREFIED RELATIVISTIC GAS,
by G. M. Zaslavskii, and S. S. Moiseev. 28 May 65, 10p. Rept. no. FTD-TT-65-100
TT , 65-63857
Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n1 p20-4 1962.

Descriptors: (*Plasma medium, Statistical functions), (*Particle beams, Statistical functions), (*Magnetohydrodynamics, Statistical functions), Gases, Tensor analysis, Kinetic theory, Plasma oscillations, Magnetic fields, Electromagnetic fields, USSR

To the number of gas states, in which anisotropic velocity distribution is possible, are included in particular, plasma in a magnetic field at neglected collisions and beam of charged particles, passing through the plasma. Study of such states is of particular interest for relativistic gas, where the length of free run of the particles is much greater than in nonrelativistic gas of very same density, and losses in energy particles during radiation substantially affect their movement. (Author)

AD-620 822 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
EFFECT OF ELECTRODE GEOMETRY OF A COAXIAL GUN ON THE PARAMETERS OF PLASMA CLOTS,
by A. O. Kalmikov, and V. G. Marinin. 13 Aug 65, 8p. Rept. no. FTD-TT-65-651
TT , 65-63866
Unclassified report

Unedited rough draft trans. of Ukrayins'kyi Fizychnyi Zhurnl (USSR) v9 n9 p1023-5 1964.

Descriptors: (*Plasma medium, Mass spectroscopy), Electrodes, Geometric forms, Materials, Capacitors, Particle accelerators, USSR

A plasma accelerator was investigated, which consists of two coaxial cylinders of stainless steel. Clots obtained from this source were investigated with the aid of a mass-spectrograph with an electric field intensity of 20 kv. The experimental results show that the density and velocity of plasma clots are not at all affected by the material of the electrodes, nor by the parameters of the discharge stakes (with the exception of capacitor capacities). The change in geometric dimensions (e. g., changes in length of central electrode) actually affects the velocity, number of fast ions and magnitude of total energy of the clot. The results of this investigation confirm the conclusion that the mechanism of accelerating the clots in a coaxial source differs from the one proposed up to this time.

AD-620 824 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF GENERATING HIGH-VOLTAGE PULSES WITH THE USE OF THE PLASMA PINCH EFFECT,
by N. V. Filippov, V. P. Vinogradov, and G. V. Golub. 12 Aug 65, 5p. Rept. no. FTD-TT-65-629
TT , 65-63868
Unclassified report

Unedited rough draft trans. of Russian patent 168 362, pub. 8 May 63, appl. 835143/26-25.

Descriptors: (*Plasma oscillations, Electric fields), (*Magnetic pinch, Electric fields), Magnetic fields, Solenoids, Gas discharges, Voltage, USSR, Patents

Object of the invention: Method of generating pulses of high tension by making use of the phenomenon of autoconstriction of a plasma column (pinch effect) which has the distinguishing feature that for the purpose of exciting on the ends of a solenoid pulses of high tension proportional to the rate of change in the magnetic flux inside the solenoid and the number of its winding turns, a gas discharge chamber is placed in a longitudinal magnetic field, along the axis of the chamber there is located an insulating tube in which there is mounted a solenoid, a magnetic field rapidly changing in time is excited through the feeding in of a high-tension pulse onto the electrodes of the gasdischarge chamber, and a change in the tension of the magnetic field is assured through the constriction of the magnetic flux connected into an annular plasma envelope which is formed with the aid of a powerful pulse discharge in the gas. (Author)

AD-620 831 Div. 25/3 ,15/1 ,25/8
CATHOLIC UNIV OF AMERICA WASHINGTON D C
APPLICATION OF THE METHOD OF TWO-TIME GREEN'S FUNCTION TO THE SPIN-1/2 HEISENBERG FERROMAGNET.
Revised ed.,
by Tohru Morita, and Tomoyasu Tanaka. 2 Sep 64, 10p. Contract AF AFOSR445 63
AFOSR , 65-1118
Unclassified report

Pub. in The Physical Review v137 n2A pA648-58 18 Jan 1965 (Copies not available to DDC or Clearinghouse customers). Prepared in cooperation with Naval Ordnance Lab., White Oak, Md. Revision of manuscript submitted 10 Jun 1964.

Descriptors: (*Ferromagnetism, Statistical mechanics), (*Green's function, Ferromagnetism), Statistical functions, Nuclear spins, Thermal properties, Hamiltonian, Iterative methods

In the usual theory of the two-time Green's function, decoupling techniques are introduced in order to obtain a self-closed equation for the lowest order Green's function. These decouplings give neither the correct temperature dependence (the absence of a T-cubed term) of magnetization nor the correct correlation function which should be zero by definition. The equation of motion for the higher order Green's function is solved in the ap-

proximation which will lead to correct results up to terms of order T-cubed in these quantities. Employing this higher order Green's function, it is found that the correction to the magnetization consists of a term of order T to the 4th power and a divergent term and that the correlation function consists of a term of order T-cubed and a divergent term. A method extracting a significant part from this divergent term is found by analyzing a system of two interacting 1/2 spins. By this method, it is shown that the T-cubed term in the magnetization is completely eliminated and that the correlation function vanishes identically. (Author)

AD-620 835 Div. 25/3 ,22/6
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
RADIATION SMOOTHING OF SHOCKS,
by M. G. Kivelson, and J. A. Welch,Jr.. Aug 65, 43p. Rept. no. RM-4683-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Plasma medium, Shock waves), (*Shock waves, Electromagnetic waves), Magnetic fields, Thermodynamics, Nuclear explosions, Partial differential equations, Inequalities

The structure of a steady-state shock temperature profile in a fully-ionized ideal gas in the presence of a magnetic field is examined. It is pointed out that many of the important qualitative features of the temperature profile can be obtained in a simple way from a nomogram whose use is described. The customary introduction of a simplifying assumption (such as the Milne-Eddington approximation) relating the radiation pressure to the radiation energy flux is postponed to indicate which predictions are clearly independent of the approximation and which features may be a consequence of it. The thermal equilibrium of the electrons with the ions in the plasma is considered, and a parameter which measures the importance of the deviation from equilibrium is given. (Author)

AD-620 856 See Fld. 21

AD-620 859 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
KINETICS OF IRREVERSIBLE PROCESSES OF REVERSE MAGNETIZATION OF FERRITES WITH RECTANGULAR HYSTERESIS LOOP,
by N. N. Sirota. 19 Aug 65, 10p. Rept. no. FTD-TT-65-622
TT , 65-63879

Unclassified report

Unedited rough draft trans. of mono. Ferrity i Beskontaktnye Elementy, Minsk, 1963 p5-10.

Descriptors: (*Ferrites, Irreversible processes), (*Magnetic properties, Ferrites), Hysteresis, Grain boundaries, Dynamics, USSR

The remagnetization process in time of ferrites with rectangular hysteresis loop is examined on the basis of a detailed analysis of the microscopic mechanism of domain wall displacement, return of magnetization vectors, mechanism of origination of remagnetization centers, as well as on macroscopic statistical examination of the process of origination and growth of remagnetization centers with consideration of the measurability of domain growth.

AD-620 864 See Fld. 20/8

AD-620 865 Div. 25/3 ,25/5 ,25/2 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
NAVAL ORDNANCE LAB CORONA CALIF
FOUNDATIONAL RESEARCH PROJECTS, APRILJUNE 1965.
Quarterly progress rept.
1 Sep 65, 26p. Task R360FR104 211 1R011 01 01
NAVWEPS , 8819

Unclassified report

Descriptors: (*Dielectric properties, Naval research), (*Quantum mechanics, Naval research), (*Spectroscopy, Naval research), Millimeter waves, Interferometers, Spectrum analyzers, Plasma physics, Electron bombardment, Cadmium, Cerium, Yttrium alloys, Gallium alloys, Garnets, Iron alloys

Three papers are presented: (1) A method of Measuring Dielectric Constants at Millimeter Wavelengths, (2) Experimental Verification of Quantum Beats Due to Coherent Excitation of Nondegenerate Excited States by Sharply Pulsed Electron Impact, and (3) Spectroscopic Study of Cerium in Yttrium Gallium and Yttrium Iron Garnet. (Author)

AD-620 900 Div. 25/3 ,25/4
CFSTI Prices: HC $1.00 MF $0.50
SYRACUSE UNIV N Y
INVESTIGATIONS ON SUBMILLIMETER WAVES, ANTIFERROMAGNETISM AND MICROWAVE RESONANCE ABSORPTION.
Progress rept. for 1 Apr-30 Jun 65,
by Gunter K. Wessel. 30 Jun 65, 3p. Contract Nonr66918

Unclassified report

See also AD-429 381.

Descriptors: (*Millimeter waves, Masers), (*Antiferromagnetism, Cobalt compounds), (*Resonance absorption, Microwaves), (*Microwaves, Resonance absorption), Molecular beams, Vacuum apparatus, Ammonia, Crystal growth, Single crystals, Bromides, Hydrates

The rotational transition of ammonia at 0.25 mm wavelength was investigated for possible use in a submillimeter maser according to our preliminary studies. As part of the work in the field of antiferromagnetism antiferromagnetic crystals were grown and electron spin resonance experiments were carried out on them. The material which was principally investigated was cobalt bromide hexahydrate.

AD-620 910 Div. 25/3
CFSTI Prices: HC $1.00 MF $0.50
MICROWAVE LAB STANFORD UNIV CALIF
PLASMA RESONANCE PROBE CHARACTERISTICS IN A MAGNETIC FIELD,
by F. W. Crawford. Jun 65, 24p. Contract AF33 616 8121 Proj. 7073 Task 707301
ARL , 65-115

Unclassified report

Descriptors: (*Probes (Electromagnetic), Plasma medium), (*Plasma oscillations, Magnetic fields), Plasma sheath, Resonance, Electrons, Partial differential equations

AD-620 934 See Fld. 9/5

AD-620 995 See Fld. 20/12

AD-620 999 See Fld. 7/3

AD-621 006 See Fld. 20/8

AD-621 013 Div. 25/3 ,15/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
SOME PROPERTIES OF OPERATORS IN ELECTROMAGNETIC THEORY,
by Ku Fu-nien. 25 Jun 65, 13p. Rept. no. FTD-TT-64-1337
TT , 65-63938

Unclassified report

Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v18 n12 p629-35 1962.

Descriptors: (*Electromagnetism, Partial differential equations), (*Operators (Mathematics), Electromagnetism), Tensor analysis, Permeability (Magnetic), Cavity resonators, Ferrites, Plasma medium, Boundary value problems, China

Maxwell's equations in nonhomogeneous and anisotropic media are investigated in the light of the theory of linear operators. The operator associated with Maxwell's equations is defined in a bounded region and can be conceived as a representation of a resonant cavity in microwave techniques. Because ferrites, plasmas and other anisotropic media are becoming more and more important in practical applications, the cases where these resonant cavities are filled with such media are studied. It is proved in this paper that the operator is symmetric for certain tensor permeability and permitivity and under certain boundary conditions. These symmetric and self-adjoint properties greatly simplify eigenfunction expansions. The orthogonal properties and the reciprocity theorem of the eigenoscillations are deduced. In the case of an antisymmetric operator, an adjoint resonant cavity is introduced. This adjoint resonant cavity is similar to the original resonant cavity in geometrical shape; the difference lies in the permeability and permitivity and the boundary conditions.

AD-621 020 Div. 25/3
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
NON-ADIABATIC PARTICLE MOTION IN COMPLEX MAGNETIC FIELDS.
Master's thesis.
by John P. Oss. 1965, 87p. Rept. no. GNE/PH/65-15

Unclassified report

Descriptors: (*Plasma medium, Containment), Particles, Motion, Magnetic fields, Magnetic pinch, Equations, Programming (Computers), Magnetic moments

The motion of particles in a four bar Ioffee bottle has been studied. A set of normalized equations were used to follow the motion of the guiding center of particles in the Ioffee bottle. The nonrelativistic equations of motion assumed conservation of energy but did not assume an adiabatic motion. The motion tended to be an oscillation from one quadrant of the system to another with a simultaneous motion along the longitudinal axis. The majority of the reflections occurred due to the longitudinal bars of the container rather than to the end mirrors. The magnetic moment of a particular particle was calculated at equally spaced steps in time. The moment varied in magnitude by twenty percent of the average value. The variation tended to fall within an envelope which could be correlated to reflections which the particle experienced. (Author)

AD-621 030 See Fld. 14/2

AD-621 034 Div. 25/3 ,25/1
CFSTI Prices: HC $2.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
BOUND WAVES IN COMPRESSIBLE PLASMA GAPS.
Research rept.,
by T. Tamir. Jul 65, 36p. Rept. no. PIBMRI-1283-65
Contract AF19 628 2357 Proj. 5635 Task 563501
AFCRL , 65-534

Unclassified report

Descriptors: (*Plasma medium, Electromagnetic waves), (*Electromagnetic waves, Propagation), Mechanical waves, Compressive properties, Plasma sheath, Ionosphere, Plasma oscillations, Partial differential equations

It is shown that a planar gap in a plasma medium is an appropriate idealized model for studying electromagnetic and plasma waves in a variety of situations, including plasma sheaths and ionospheric layers. A uniform, isotropic, lossless, warm plasma gap is investigated and is found to support both surface and interface waves which consist of an electromagnetic mode coupled to a plasma pressure mode. The surface waves are fast and they occur primarily at frequencies below the plasma frequency, whereas the interface waves are slow and are present at all frequencies; in both cases, the waves may be either of the forward- or backward-travelling variety. In addition, the presence of leaky waves of the spectral type is demonstrated at frequencies above the plasma frequency. Dispersion curves are calculated for a large range of the parameters involved and the results are compared to those for surface waves along a dielectric slab which, in certain respects, represents a configuration analogous to the plasma gap if pressure effects are neglected. (Author)

AD-621 036 See Fld. 20/12

AD-621 038 See Fld. 20/12

AD-621 052 Div. 25/3 ,9/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTROMAGNETIC SHOCK WAVES AND THEIR APPLICATION FOR THE FORMATION OF SHORT PULSES,
by S. P. Kapitsa. 9 Jun 65, 10p. Rept. no. FTD-TT-65-92
TT , 65-63952

Unclassified report

Unedited rough draft trans. of mono. Voprosy Fiziki Elementarnykh Chastits, 1963 p573-7.

Descriptors: (*Pulse generators, Shock waves), (*Shock waves, Pulse generators), (*Electromagnetic pulses, Propagation), (*Magnetohydrodynamics, Shock waves), Ionization chambers, Particle trajectories, Electric currents, Voltage, Ferrites, Coaxial cables

The purpose of this report is to point out the possibilities of utilizing electromagnetic shock waves and methods developed on their bases to obtain high voltage pulses of nano second duration for spark chambers.

AD-621 054 See Fld. 20/8

AD-621 055 See Fld. 9/2

AD-621 113 Div. 25/3 ,25/7 ,25/8
LINCOLN LAB MASS INST OF TECH LEXINGTON
HIGHER ORDER CORRECTIONS TO THE MOLECULARFIELD THEORY OF THE MAGNETIC STATE,
by Gene F. Dresselhaus. 9 Mar 65, 6p. Rept. no. JA-2535
Contract AF19 628 5167
ESD , TDR-65-436

Unclassified report

Pub. in Physical Review v139 n3A pA855-9 Aug 2 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Molecules, Field theory), (*Magnetic properties, Molecules), Corrections, Thermodynamics, Hamiltonian, Perturbation theory, Ferromagnetism, Phase studies

A generalized Weiss molecular-field calculation is presented for the solution to the Heisenberg Hamiltonian. Thermodynamic perturbation theory is used to define a series of approximations for the magnetic state. In particular, the equations for the ferromagnetic state are expanded near the transition temperature T in order to examine the temperature dependence of chi. Numerical results suggest that 6th-order perturbation theory gives the susceptibility accurately in the temperature range above 1.5T. (Author)

AD-621 130 See Fld. 20/12

AD-621 134 See Fld. 9/3

AD-621 138 Div. 25/3 ,25/6
CFSTI Prices: HC $1.00 MF $0.50
NEW YORK UNIV N Y DEPT OF PHYSICS
STUDY OF THE MECHANISM AND PROPERTIES OF THE PHOTOVOLTAIC AND PHOTOCONDUCTIVE EFFECTS IN ORGANIC SUBSTANCES.
Final rept. for 1 Nov 63-31 Oct 64,
by Hartmut P. Kallmann. Mar 65, 23p. Contract AF19 628 2446 Proj. 8659 Task 865901
AFCRL , 65-240

Unclassified report

Descriptors: (*Organic materials, Photoelectric effect), (*Photoelectric effect, Organic materials), (*Photoconductivity, Organic materials), Polycyclic compounds, Germanium, Zinc compounds, Sulfides, Semiconducting films, Illumination, Absorption, Photochemistry, Solutions, Cadmium compounds, Single crystals

Research results in the following areas are reported: Larger than band gap photovoltages in anthracene, germanium layers, and evaporated zinc sulfide layers; and photovoltages due to inhomogeneous absorption of light and to chemical effects in organic solutions (E.G., alpha-methyl naphthalene, benzene, hemimellitine, mesitylene) and in cadmium sulfide single crystals.

AD-621 157 Div. 25/3 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
MARYLAND UNIV COLLEGE PARK DEPT OF PHYSICS AND ASTRONOMY
EXPERIMENTAL PROGRAM.
Status rept. for 1 Jun-31 Aug 65,
by Hans R. Griem. 31 Aug 65, 5p. Contract Nonr59510

Unclassified report

Descriptors: (*Plasma physics, Spectroscopy), Line spectrum, Ultraviolet spectroscopy, Shock waves, Lasers

Contents: Measurement of Stark broadening of lines from light elements; Measurement of UV radiation from shock-heated plasmas; Collisionless plasma shock wave experiment; Plasma diagnostics by light scattering; Theoretical program.

AD-621 213 Div. 25/3 ,25/8
CFSTI Prices: HC $6.00 MF $1.25
NORTHWESTERN UNIV EVANSTON ILL GAS DYNAMICS LAB
AN EXPERIMENTAL DETERMINATION OF THE THERMAL AND ELECTRICAL CONDUCTIVITY OF ATMOSPHERIC ARGON PLASMA,
by Carl F. Knopp. Jan 65, 212p. Rept. no. NU-GDL-B-1-65
Contract AF49 638 879 Grant ,AF AFOSR62 307
AFOSR , 65-1338

Unclassified report

Descriptors: (*Argon, Plasma physics), (*Plasma physics, Argon), Ionic current, Plasma medium, Gas ionization, Atmosphere, Electrical conductance, Thermal conductivity, Electric discharges, Spectroscopy

A wall stabilized arc was used to produce an equilibrium, cylindrically symmetric, argon plasma column. It was demonstrated that axial temperature gradients are negligible over a significant length of the plasma column, thus verifying the assumption that, at low flow rates, convective heat losses are not important for this type of device. The radial temperature distribution within the arc column was ascertained by spectroscopic analysis for arc currents of 30 to 60 amperes. Temperatures obtained from absolute line and absolute continuum radiation were in excellent agreement. An empirical expression, based upon the Kramers-Unsold theoretical model, was obtained for the radiated power, as a function of temperature, of argon plasma. The electrical conductivity of argon was calculated using Spitzer's electron-electron collision correction. A technique was developed to determine the electrical conductivity from the arc currents, voltage gradients and the measured temperature profiles. Using this technique, the electrical conductivity of argon plasma as a function of temperature was determined for the temperature range of 8,500 K to 12,000 K. The experimental electrical conductivity showed good agreement with the calculated electrical conductivity. Using the measured temperature profiles, calculated radiated power, and experimentally verified electrical conductivity, the thermal conductivity of argon was determined for the same temperature range as the electrical conductivity. The data were in good agreement with theoretically predicted results. (Author)

AD-621 265 Div. 25/3 ,15/1
TOWNE SCHOOL OF CIVIL AND MECHANICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
USE OF THE VARIATIONAL APPROACH TO DETERMINE BOUNDS FOR THE EFFECTIVE PERMITTIVITY IN RANDOM MEDIA,
by M. Beran. 28 Sep 64, 12p. Contract DA ARO D31 124G331
AROD , 3734:9

Unclassified report

Pub. in Il Nuovo Cimento v38 (Ser10) p771-82 1965 (Copies available only to DDC users).

Descriptors: (*Dielectric properties, Calculus of variations), Electric fields, Perturbation theory, Integrals, Statistical functions, Series

Bounds are derived for the effective permittivity, e*, using two standard variational principles. The principles are expressed in terms of the electric field, E and the electric displacement, D, respectively. As trial functions perturbation expansions are used for E and D that have been modified by the inclusion of a set of multiplicative constants. The first-order perturbation effect is calculated explicitly and the bounds for e* are found in terms of expressions involving third-order correlation functions. In the limit of small perturbations the bounds coincide and yield the result obtained by previous investigators. (Author)

AD-621 276 See Fld. 10

AD-621 284 See Fld. 20/4

AD-621 296 See Fld. 20/8

AD-621 302 Div. 25/3
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
INTENSE MAGNETIC FIELDS,
by A. J. Freeman. 1964, 2p. Contract AF19 604 7344 Proj. 9764
AFOSR , 65-1174

Unclassified report

Pub. in the NEREM Record, papers presented at the Meeting on 4, 5 and 6 Nov 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Magnetic fields, Scientific research), Materials, Molecular structure

A review is presented of the developments in and importance of intense magnetic field research. Intense magnetic fields are considered to be those above 30,000 gauss and are produced by air core magnetc up to 160,000 gauss on a continuous

basis. In basic research, magnetic fields are valuable in revealing the structure of specific materials and the general physical laws governing all matter. Intense magnetic fields reveal a considerable amount of data that could not be obtained at all or that would be much less effective with weaker fields. (Author)

AD-621 348 See Fld. 20/8

AD-621 370 See Fld. 4/2

AD-621 407 Div. 25/3
BATTELLE MEMORIAL INST COLUMBUS OHIO
OSCILLATORY MAGNETIC PROPERTIES OF NEARLY FREE ELECTRONS,
by M. L. Glasser. 25 Jan 65, 4p. Contract AF AFOSR260 63 Proj. 9761 Task 976101 AFOSR , 65-1372

Unclassified report

Pub. in Physics Letters v15 n1 p17-8 Mar 1 1965 (Copies available only to DDC users).

Descriptors: (*Magnetic properties, Metals), (*Electrons, Metals), Oscillation, Atomic energy levels

Theory interpreting oscillatory magnetic properties of metals is considered. It is suggested that a proper way to investigate the problem would be to calculate the oscillatory part of the free energy of a gas of Bloch electrons in a magnetic field, but this is a mathematically intractable problem. This investigation presents a simple model formulated on the basis of some approximations which permit a relatively straight forward analytic solution. The princi pal assumption is that the metal to be described is amenable to the weak pseudopotential approximation. The oscillatory free energy can be evaluated analytically if the potential is constant normal to the periodic along the uniform magnetic field. (Author)

AD-621 429 Div. 25/3 ,9/1
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
PRANDTL-MEYER FLOW WITH A TRANSVERSE MAGNETIC FIELD.
Master's thesis,
by Ronald Alfred Zollner. Jun 65, 70p. Rept. no. GAM-65B/AE/65-8

Unclassified report

Descriptors: (*Magnetohydrodynamics, Supersonic flow), (*Supersonic flow, Magnetic fields), Two-dimensional flow, Compressible flow, Plasma medium, Electrical conductance, Specific heat

The purpose of this study was to solve the classical Prandtl-Meyer flow problem under the influence of a transverse magnetic field. Maxwell's equations, the continuity equation, the momentum equation, and the constitutive equations were used in the analytical solution along with geometrical relations. Steady, inviscid, twodimensional, compressible flow was assumed. The plasma was considered to have an infinite electrical conductivity and a constant ratio of specific heats. Solutions were obtained relating the turning angle with the magnetic Mach number and the Karman number. These properties, the magnetic Mach angle, and the gasdynamic Mach number were tabulated in an appendix. It was found that the maximum turning angle decreased as the strength of the magnetic field increased; ranging from 130.5 degrees with no magnetic field to 65.88 degrees for an infinite field. (Author)

AD-621 442 Div. 25/3
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A STUDY OF ONE-DIMENSIONAL MAGNETOGASDYNAMICS.
Master's thesis,
by Peter Wayne Tracy. May 64, 153p. Rept. no. GAM/AE/64-3

Unclassified report

Descriptors: (*Magnetohydrodynamics, Onedimensional flow), Mathematical analysis, Partial differential equations, Heat transfer, Shock waves, Plasma physics, Energy, Programming (Computers)

Five flows in steady one-dimensional magnetogasdynamics have been studied. These five flows are: Fanno flow; Rayleigh flow; Isentropic flow with area change; Flow with combined heat transfer, wall friction and area change; and Magnetogasdynamic normal shock. The flow variables exhibit a discontinuity where the magnetic Mach number (M sub m) is equal to one. An entropy maximum occurs at this point. The Karman number K is used to define the flow regions in onedimensional magnetogasdynamics just as Mach number defines the flow regions in gasdynamics. The Karman number K* at M sub m=1 is the critical Karman number for the magnetogasdynamic flow. In one-dimensional magnetogasdynamic Fanno flow the pressure and temperature exhibit maxima in the subcritical region (K<K*). The Mach number has a minimum in the subcritical region. This behavior does not occur in gasdynamic Fanno flow. In one-dimensional magnetogasdynamic Rayleigh flow, Mach number has a minimum, pressure a maximum and temperature a maximum in the subcritical region. Gasdynamic Rayleigh flow exhibits a temperature maximum for M<1 that is similar to the magnetogasdynamic temperature maximum. The analysis of isentropic flow with area change is found to involve the integration of a first order differential equation known as the Darboux equation. This integration has not been accomplished. It is seen that the magnetogasdynamic flow with area change, heat transfer and wall friction can be formulated. The magnetogasdynamic equations for this combined flow reduce identically to the gasdynamic equations as the magnetic field goes to zero. (Author)

AD-621 457 See Fld. 20/14

AD-621 466 See Fld. 21/8

AD-621 499 See Fld. 9/5

AD-621 501 Div. 25/3 ,12/1
CFSTI Prices: HC $3.00 MF $0.75
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS
INVESTIGATION OF THE BASIC CONTAMINANT REACTIONS IN RE-ENTRY WAKES.
Final rept. on proj. DEFENDER for 1 Jun 64-31 May 65,
by R. H. Bullis, R. J. Andersen, T. L. Churchill, and V. E. Grob. 28 Jun 65, 85p. Rept. no. UACRL-D-920252-6
Contract DA31 124ARO D221 Proj. arpa order no. 553

Unclassified report

Descriptors: (*Reentry vehicles, Wake), (*Wake, Chemical reactions), (*Plasma medium, Impurities), Sodium compounds, Hydroxides, Electrons, Density, Probability, Crossed field devices, Electron beams, Molecular beams, Ionization, Cyclotron resonance phenomena

Three different experimental laboratory investigations were conducted to determine the effect of the presence of impurities which exist in re-entry wakes in the form of alkali metals and their compounds on the electron number density and effective collision frequency. In the first experimental investigation, electron cyclotron resonance techniques were used to measure the equilibrium electron number density and effective electron collision frequency in sodium hydroxide vapor over the energy range from 0.09 to 0.126 eV. In the second investigation, a modified Ramsauer beam experiment was used to determine the total collision cross section of sodium ions with several of the atmospheric constituents, such as oxygen, nitrogen, and nitric oxide, over the energy range of 1.08 to 10.35 eV. In the third investigation, a crossed-beam double modulation technique, in which an electron beam was interacted with a molecular beam of sodium hydroxide, was used to study negative ion production by electron impact.

AD-621 521 See Fld. 1/3

AD-621 523 See Fld. 20/13

AD-621 571 See Fld. 20/4

AD-621 587 See Fld. 7/1

AD-621 602 Div. 25/3 ,25/6 ,25/7
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE PHYSICS
CALCULATIONS ON THE TEMPERATURE DEPENDENCE OF THE KNIGHT SHIFT IN LIQUID METALS AT CONSTANT VOLUME AND ITS MEASUREMENT IN SODIUM.
Revised ed.,
by Hirohisa Endo, B. K. Jones, Mitsuo Watabe, and Minoru Tanaka. 11 Feb 65, 8p. Rept. no. NRC-8722

Unclassified report

Pub. in Philosophical Magazine, v12 n116 p347-54 Aug 1965. (Copies available only to DDC users). Prepared in cooperation with Institute of Solid State Physics, Tokyo Univ. (Japan).

Descriptors: (*Magnetic properties, Liquid metals), (*Liquid metals, Atomic energy levels), Electron transitions, Sodium, Temperature, Potential theory

The temperature dependence of the Knight shift in liquid metals at constant volume is investigated theoretically on the basis of the nearly-free-electron model. A comparison is made of the theoretical value with the experimental value determined here for sodium. The ratio of the temperature coefficients of the liquid and solid state is also discussed. (Author)

AD-621 613 See Fld. 20/12

20/4. FLUID MECHANICS

AD-620 811 Div. 9/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ON THE APPLICABILITY OF A MONODIMENSIONAL MODEL IN DESCRIBING THE STATIONARY FLOW OF A VISCOUS INCOMPRESSIBLE LIQUID IN A CYLINDRICAL PIPE WITH PERVIOUS WALLS,
by B. A. Raizberg, and K. P. Samsonov. 18 Jun 65, 8p. Rept. no. FTD-TT-65-318 TT , 65-63854

Unclassified report

Unedited rough draft trans. of Inzhenernyi Zhurnal (USSR) v4 n1 p127-9 1964.

Descriptors: (*Incompressible flow, Pipes), Model theory, Gas flow, Viscosity, Cylindrical bodies, USSR

Flow of liquid in pipes is usually described on the basis of a monodimensional system. The irregularity in the distribution of hydrodynamic flow parameters in transverse section is considered the introduction into equation of motion of coefficients, the magnitude of which depends upon the flow condition of the liquid (1,2). In this report the possibility is analyzed of such an approach to a stable

flow in a cylindrical pipe with porous walls, through which the liquid is fed.

AD-620 830 Div. 9/1
BROWN UNIV PROVIDENCE R I
SOME NON-NEWTONIAN EFFECTS IN FLOW THROUGH TUBES,
by A. C. Pipkin. 1965, 10p. Contract DA ARO D31 124G484
AROD, 1271:44
Unclassified report

Papers of the International Congress on Rheology (4th). (Copies available only to DDC users).

Descriptors: (*Viscoelasticity, Fluid flow), (*Fluid flow, Viscoelasticity), Stresses, Pipes, Mathematical analysis

Rectilinear flow of nonlinear viscoelastic fluids through straight tubes can only occur if the tube is of circular cross section or if the rheological constants satisfy certain relations. The present review gives a qualitative discussion of these results and considers the matter of the normal stress distribution on the walls of the tube. The related problem of oscillating flow is discussed briefly. (Author)

AD-620 847 **See Fld. 5/1**

AD-620 863 **See Fld. 20/13**

AD-620 867 Div. 9/6
CFSTI Prices: HC $3.00 MF $0.75
ASTROMECHANICS RESEARCH DIV GIANNINI CONTROLS CORP MALVERN PA
PREDICTION OF DYNAMIC RESPONSE FROM FLUTTER ANALYSIS' SOLUTIONS.
Technical rept.,
by Frank J. Frueh, and Jacob M. Miller. Jun 65, 70p. Contract AF49 638 1015
AFOSR, 65-0952
Unclassified report

Descriptors: (*Flutter, Mathematical analysis), (*Aeroelasticity, Mathematical prediction, Aerodynamic characteristics, Transformations (Mathematics), Supersonic flow, Transonic flow, Subsonic flow, Wings, Bombers, Fighters

The report presents the development of a dynamic response prediction method based on the transformation of classical flutter analysis solutions. The development is accomplished through investigation of the equations of motion of the flutter system for the determination of relationships of this system which are also common to the dynamically responding system's equations of motion. Several special operators were discovered to relate these two systems. Theodorsen incompressible aerodynamics and Ackeret's source pulse aerodynamics were used in the development of the dynamic response prediction method. As a result of these efforts, the analyst may now predict an aeroelastic system's dynamic response in a manner independent of system basic parameters by merely transforming the solutions of a simple-harmonic-motion, required-structuraldamping flutter analysis. (Author)

AD-620 871 Div. 9/7
CFSTI Prices: HC $4.00 MF $0.75
CORNELL AERONAUTICAL LAB INC BUFFALO N Y
A COMPARISON OF PRESSURES PREDICTED BY EXACT AND APPROXIMATE THEORIES WITH SOME EXPERIMENTAL RESULTS ON AN OGIVAL NOSED BODY AT A MACH NUMBER OF 2.00,
by Fulton E. Dye Jr.. Dec 51, 113p. Rept. no. CAL/CF-1723
Contract NOrd10057 Task CAL1A7
Unclassified report

Descriptors: (*Ogives, Aerodynamic loading), Noise cones, Experimental data, Pressure, Supersonic flow, Turbulence

A comparison is made of the pressures which are predicted by use of the exact theory of Stone, as well as by the approximate 'small perturbations' theory, with some experimental results obtained on an ogival nose of a fusiform body. The theoretical semi-vertex angle of this ogival nose was designed to be 11 degrees 19 minutes; the tests were run at a Mach number of 2.00. (Author)

AD-620 873 **See Fld. 8/10**

AD-620 874 **See Fld. 13/13**

AD-620 896 **See Fld. 4/2**

AD-620 909 Div. 9/7
CFSTI Prices: HC $3.00 MF $0.75
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS AERODYNAMIC LAB
THE LAMINAR BOUNDARY LAYER IN AXISYMMETRIC HYPERSONIC NOZZLES WITH WALL COOLING.
Interim technical rept. no. 2, 1 Apr-15 Nov 64,
by Ross G. Luce, Gerald M. Gregorek, and John D. Lee. Jun 65, 57p. Rept. no. 1657-2
Contract AF33 657 11060 Proj. 7065 Task 706501
ARL, 65-112
Unclassified report

Descriptors: (*Hypersonic nozzles, Cooling), Axially symmetric flow, Laminar boundary layer, Heat transfer, Pressure, Coolants, Programming (Computers), Momentum, Thickness

An experimental and analytic investigation of the influence of wall cooling on conical hypersonic nozzles operated at moderately low Reynolds numbers is reported. The experimental program consisted of nozzle static pressure distributions and impact pressure surveys of a nominal M = 12, 3-inch exit diameter conical nozzle equipped with a coolant tank to allow for the adjustment of the wall temperature. Various coolants (water, freon-dry ice mixture, and liquid nitrogen) were used to provide selected wall temperatures down to 210R. The measurements showed a 25% reduction of the displacement and boundary layer thicknesses when referred to a nozzle equilibrium temperature of 670R. The momentum integral technique was used to formulate a digital computer program to examine the wall cooling effects on hypersonic axisymmetric nozzles. A Pr number of one is assumed. Fourth order velocity and total enthalpy profiles were used. These profiles were adjusted to account for wall temperature, transverse curvature, and pressure gradient. Results from this computer program were confirmed by the experiments. (Author)

AD-620 929 **See Fld. 13/10**

AD-620 959 **See Fld. 16**

AD-621 018 Div. 9/7
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
INVESTIGATION OF THE MIXING REGION BETWEEN THE PRIMARY AND SECONDARY STREAMS OF A TWODIMENSIONAL SUPERSONIC AIR-AIR EJECTOR SYSTEM.
Master's thesis,
by James R. Nelson. Jun 65, 94p. Rept. no. GAM-65B/ME/65-6
Unclassified report

Descriptors: (*Jet mixing flow, Supersonic flow), (*Supersonic flow, Jet mixing flow), Jet pumps, Two-dimensional flow, Turbulence, Interferometers, Nozzle gas flow, Distribution

The turbulent mixing region of a two-dimensional, supersonic, air-air ejector system was experimentally investigated utilizing an interferometer. Density distributions for the two-stream mixing region within the ejector duct were established for 6 different test configurations. Similarity of the density distributions was indicated for mixing region cross sections as close as one nozzleexit hydraulic diameter from the nozzle. Density profiles at successive downstream duct locations were plotted to show the spread of the mixing region. The effect of normal and oblique shocks on the rate of spread of the mixing region was found to be small. In addition, ejector performance data and techniques for spark lamp photography are presented. It is concluded that the interferometer could be effectively utilized to help determine the transport coefficients of ejector system turbulent mixing processes. (Author)

AD-621 024 **See Fld. 14/2**

AD-621 027 **See Fld. 14/2**

AD-621 028 Div. 9/7
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
INVESTIGATION OF THE EFFECT OF PLUG TRANSLATION ON THE THRUST VECTOR OF A MACH 3 PLUG NOZZLE.
Master's thesis,
by Richard K. Ellingson. Jun 65, 47p. Rept. no. GAM 65B/ME/65-3
Unclassified report

Descriptors: (*Plug nozzles, Thrust), Motion, Supersonic nozzles, Thrust vector control systems, Pressure, Two-dimensional flow, Exhaust nozzles

An experimental investigation was made of a convergent plug exhaust nozzle to determine if effective thrust vectoring could be achieved through the use of a translating plug which travels in plane motion across a base region of slightly increased diameter. The objective was to determine if effective thrust vectoring could be obtained at higher pressure ratios than 6.2. Results showed that when operating at pressure ratios below the design value the amount and direction of thrust vectoring obtained was a strong function of the pressure ratio. For underexpanded operation the thrust vectoring was found to be nearly independent of the pressure ratio, but of too small a magnitude to be significant. The axial thrust was materially reduced by the step in both plugs.

AD-621 052 **See Fld. 20/3**

AD-621 070 Div. 9/4 ,14/6
CFSTI Prices: HC $1.00 MF $0.50
OKLAHOMA STATE UNIV STILLWATER SCHOOL OF CIVIL ENGINEERING
FRICTION REDUCTION EFFECTS ON TURBULENT FLOWS OF WATER IN ROUGH PIPES BY DILUTE ADDITIVE OF HIGH MOLECULAR WEIGHT POLYMER.
Technical rept.,
by E. Rune Lindgren. Jun 65, 25p. Rept. no. TR-1
Contract Nonr259505 Proj. S R009 01 01 Task 103
Unclassified report

Descriptors: (*Turbulence, Friction), (*Friction, Lubricants), (*Epoxy plastics, Additives), Polymers, Molecular weight, Pipes, Surface properties, Reduction, Fluid flow, Water, Distillation

An experimental investigation was made of the reduction of frictional losses in turbulent flows of distilled water through rough tubes by dilute additives of polyethylenoxide of molecular weight 4,000,000. Remarkable reduction of the turbulent

energy losses were obtained for 0.002-0.006% concentration of additive in the flow, even to values lower than for smooth turbulent flows. (Author)

AD-621 071 Div. 9/4
CFSTI Prices: HC $3.00 MF $0.75
OKLAHOMA STATE UNIV STILLWATER SCHOOL OF CIVIL ENGINEERING
EXPERIMENTAL STUDY ON TURBULENT PIPE FLOWS OF DISTILLED WATER.
Technical rept.,
by E. Rune Lindgren. Jul 65, 66p. Rept. no. TR-2
Contract Nonr259505 Proj. S R009 01 01 Task 103
Unclassified report

See also AD-621 070.

Descriptors: (*Turbulence, Water), Fluid dynamic properties, Distillation, Wake, Velocity, Distribution, Graphics, Pipes, Friction, Additives, Heat transfer, Epoxy plastics

Experimental investigation verifying current concepts on fully developed turbulent pipe flow. Previous contradictions and uncertainties on certain details may now be considered as resolved, also showing that Nikuradses 'classical' experiments must be in error. Serving as a preparation to future studies on turbulent flows of distilled water with certain high molecular weight additives it is shown that presently applied technique is recommendable also for such studies. It appears that minute amounts of additive may have a remarkable influence upon certain thermal properties of distilled water. (Author)

AD-621 085 Div. 9/7 ,9/2
CFSTI Prices: HC $5.00 MF $1.00
DEFENSE RESEARCH LAB UNIV OF TEXAS AUSTIN
EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF SURFACE ROUGHNESS ON COMPRESSIBLE TURBULENT BOUNDARY LAYER SKIN FRICTION AND HEAT TRANSFER.
Technical rept.,
by Frank Levi Young. May 65, 164p. Rept. no. DRL-532 ,CR-21
Contract NOrd16498 Task UTX2
Unclassified report

Descriptors: (*Flat plate models, Supersonic characteristics), (*Aerodynamic heating, Surface properties), Compressible flow, Turbulent boundary layer, Heat transfer, Friction, Reynolds numbers, Tables, Incompressible flow

An experimental investigation was carried out to determine the effects of surface roughness on the turbulent boundary layer skin friction and heat transfer rates in air at a Mach number of 4.93. Four flat plate model configurations were tested. Simultaneous measurements of the local skin friction and heat transfer were made. The results of these measurements and of boundary layer pressure surveys are presented. Agreement of the smooth plate results with accepted theories acts to substantiate the results of measurements using the rough-surfaced models. A method is given to determine the equivalent incompressible sand-grain roughness of a surface based on experimental knowledge of the skin friction in compressible flow. In addition, a method to account for heat transfer effects in the calculation of skin friction coefficients for rough plates is suggested. Using the experimental results, the validity of the Reynolds analogy between heat transfer and skin friction is examined. A method to determine the Reynolds number based on the length of the turbulent boundary layer from measurements of the skin friction and momentum thickness for smooth or rough flat plates is also given. (Author)

AD-621 146 Div. 9/1 ,9/6
CFSTI Prices: HC $6.00 MF $1.25
SPACE AND INFORMATION SYSTEMS DIV NORTH AMERICAN AVIATION INC DOWNEY CALIF
DYNAMICS OF SHELL-LIKE LIFTING BODIES. PART I. THE ANALYTICAL INVESTIGATION.
Final rept., pt. 1, 1 May 63-1 Dec 64,
by F. C. Hung, A. C. Park, C. Chan, L. V. Andrew, and L. L. T. Au. Jun 65, 230p. Rept. no. SID-64-2074-1
Contract AF33 657 11115 Proj. 1370 Task 137003
FDL , TR-65-17 P1
Unclassified report

Descriptors: (*Structural shells, Vibration), (*Aerodynamic configurations, Lift), Flexible structures, Reinforcing materials, Mathematical analysis, Flutter, Frequency

The vibration characteristics of typical shell-like lifting bodies, consisting of an outer skin covering and stiffened with both longitudinal stringers and transverse parallel flexible frames, were investigated using an approach based upon the matrix force method. Following an extensive literature survey, matrix equations were developed for structural flexibility characteristics of a stiffened shell with free-fixed boundary conditions and the equations of motion for free vibration were solved to determine natural frequencies and mode shapes. Equations of motion of a general stiffened shell configuration with free-free boundary conditions were developed and applied to the special case of a stiffened shell with a rigid root frame. A mode modifying matrix was determined which allows solution of the equations using structural flexibility parameters established for the shell with free-fixed boundary conditions. Analytical results for the case with free-fixed boundary conditions are compared with results obtained from an experimental investigation performed upon nine typical configurations and conclusions and recommendations are presented. (Author)

AD-621 162 Div. 9/7 ,9/6
CFSTI Prices: HC $2.00 MF $0.50
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS
A REVIEW OF THE WORK PERFORMED AT THE POLYTECHNIC INSTITUTE OF BROOKLYN AEROSPACE INSTITUTE.
Rept. for 1 Sep 57-31 Aug 63,
by Antonio Ferri, and Roberto Vaglio-Laurin. Sep 63, 34p. Rept. no. PIBAL-809
Contract AF49 638 217 Proj. 9781
AFOSR , 5428
Unclassified report

Descriptors: (*Supersonic flow, Reviews), (*Hypersonic flow, Reviews), Theory, Experimental data, Reentry vehicles, Aerodynamic characteristics, Lift, Drag, Aircraft, Guided missiles, Heat transfer, Shock waves, Vorticity, Plasma medium

A summary is given of theoretical and experimental investigations on fundamental aspects of inviscid and viscous flow problems in the supersonic and hypersonic speed regimes. (Author)

AD-621 200 Div. 9/1 ,9/2
CFSTI Prices: HC $2.00 MF $0.50
COLUMBIA UNIV NEW YORK PLASMA LAB
A KINETIC-THEORETIC DESCRIPTION OF SHOCK WAVE FORMATION II.
Scientific rept.,
by C. K. Chu. Feb 65, 31p. Rept. no. SR-16
Contract AF49 638 1254 Proj. 9752 Task 975202
AFOSR , 65-1265
Unclassified report

See also AD-606 511.

Descriptors: (*Shock waves, Kinetic theory), (*Kinetic theory, Shock waves), Boundary value problems, Shock tubes, One-dimensional flow, Three-dimensional flow, Numerical analysis, Dynamics

This paper extends the method and results previously obtained for shock waves in 1-dimensional gas to a monatomic 3-dimensional gas. The classical Riemann problem--the flow of a gas in a shock tube--is treated as an initial value problem for the Krook equation, after the Krook equation is first reduced to two simultaneous Krook equations each for a 1-dimensional gas. Results are obtained on the formation of shocks corresponding to Mach numbers of 1.27, 1.5, and 1.75. It is seen that the stronger the shock, the shorter the formation time. The short time behavior of the flow agrees with free flow, while the long time behavior agrees with fluid dynamics. (Author)

AD-621 214 Div. 9/2 ,10/7
CFSTI Prices: HC $4.00 MF $1.00
CALIFORNIA UNIV BERKELEY INST OF ENGINEERING RESEARCH
EXPERIMENTAL STUDY OF WAVE PHENOMENA ASSOCIATED WITH THE ONSET OF GASEOUS DETONATION,
by P. A. Urtiew. Feb 65, 130p. Rept. no. AS-65-1
Contract AF AFOSR129 64
AFOSR , 65-1277
Unclassified report

Descriptors: (*Detonation waves, Boundary layer transition), (*Fluid mechanics, Detonation waves), (*Combustion, Boundary layer transition), Explosion effects, Deflagration, Mixtures, Explosive gases, Oxygen, Hydrogen, Boundary layer, Sound, Schlieren photography

The study is concerned with wave processes that occur at the instant of transition from the deflagrative to the detonative mode of propagation of the combustion wave in an explosive gas mixture. Experimental observations were made by means of Schlieren photography with pressure transducer measurements using stoichiometric hydrogen-oxygen mixtures contained initially, under normal pressure and temperature, in a 1 x 1-1/2 inch rectangular, cross-section tube. Theoretical interpretation of experimental results revealed that the transition is promoted by the action of a spherical detonation wave generated by a point explosion ahead of the main combustion zone. Upon reflection from the walls this gives rise to a sound wave system oscillating transversely to the axis of the tube and bounded in the direction of the axis, on one side, by the detonation front propagating into the unburned medium and, on the other, by the retonation shock moving into the burned gas. (Author)

AD-621 242 Div. 9/7 ,9/6
CFSTI Prices: HC $6.00 MF $1.25
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF LAMINAR AND TURBULENT AIR FLOW IN A TUBE WITH AN ENTRANCE MACH NUMBER OF FIVE.
Doctoral thesis,
by George Arthur Brown. 14 May 60, 265p.
Rept. no. TR-7359-13
Contract N5ori07897 ,AF49 638 442 Proj. DSR7359,DSR7962
AFOSR , 3492
Unclassified report

Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Div. of Sponsored Research.

Descriptors: (*Pipes, Hypersonic characteristics), (*Laminar flow, Pipes), (*Turbulence, Pipes), Supersonic flow, Boundary layer, Pressure, Test equipment

The use of the flow in the entrance region of a tube was demonstrated as being a practical and inexpensive means for obtaining accurate data for laminar boundary layer flows at supersonic and hypersonic speeds. The measurements for the laminar boundary layer, obtained with an entrance Mach number of about five, were in excellent agreenent with available theoretical predictions. Special features of the apparatus for the high-speed flow re-

search program included a test section constructed with removable sections, a micromanometer for use at low pressures and with improved response characteristics, and small combination probes for boundary layer studies. An investigation was made of the adiabatic flow of air in the entrance region of a tube with an inlet Mach number of about five. The measured static pressures, wall temperatures, recovery factors, local friction coefficients, boundary layer profiles, etc. were in excellent agreement with available theoretical predictions for the laminar boundary layer. The results for the turbulent boundary layer and location of transition were in good agreement with available data.

AD-621 243 See Fld. 20/13

AD-621 251 Div. 9/1 ,15/1
CFSTI Prices: HC $4.00 MF $1.00
LILLE UNIV (FRANCE)
DERIVATION AND SOLUTION OF THE EQUATIONS OF COMPATIBILITY OF A GAS.
Final rept.,
by R. Berker. 3 May 65, 137p. Contract AF61 052 710
AFOSR , 65-1227

Unclassified report

Descriptors: (*Gases, Compatibility), (*Fluid mechanics, Equations), Vector analysis, Boundary value problems, Continuum mechanics, France

The author considers a gas having no viscosity and which is thermally not conducting. The object of this report is to eliminate from the equations governing the motion of this gas all the unknown quantities other than the velocity. This elimination gives equations of compatibility containing only the velocity and the external force, which is supposed to be known. The inverse method is employed.

AD-621 284 Div. 9/1 ,25/3
STRATHCLYDE UNIV GLASGOW (SCOTLAND) DEPT OF MATHEMATICS
UPSTREAM INFLUENCE EFFECTS IN THE FLOW OF A CONDUCTING FLUID OVER AN INSULATING WALL.
Revised ed.,
by G. W. Swan. 14 Oct 64, 15p. Contract AF AFOSR22 63 ,AF AFOSR6 64
AFOSR , 65-1362

Unclassified report

Pub. in Quarterly Journal of Mechanics and Applied Mathematics v18 pt2 p243-55 May 1965 (Copies available only to DDCusers). Revision of manuscript submitted 1 Jul 64.

Descriptors: (*Fluid flow, Perturbation theory), Dynamics, Magnetohydrodynamics, Hypersonic flow, Solids, Mathematical analysis

In conventional gas dynamics there is no great difficulty encountered when studying the propagation of a disturbance through the two-dimensional steady supersonic flow of a perfect gas past a straight-edged wall. A two-dimensional disturbance introduced into the flow travels along the appropriate Mach line to the wall from which it is then reflected downstream. The flow of a uniform stream past a wall convex to the stream is achieved by means of the well-known Prandtl-Meyer expansion. Flows in channels and similar problems can be analysed by the techniques of the method of characteristics. In magneto-gasdynamics, however, the corresponding problems for the flow of an infinitely conducting gas indicate that situations arise in which disturbances not only propagate upstream in the gas but can also propagate in all directions in the solid wall. One immediate consequence is that the conditions upstream can be continually modified. To obtain a qualitative understanding of these processes a mathematical analysis is presented. In a recent paper by Chu, the flow everywhere is uniform and the disturbances are created only at the boundary between the gas and the non-conducting solid. The present paper includes the work of Chu as a particular case. (Author)

AD-621 336 See Fld. 8/10

AD-621 343 Div. 9/7 ,9/6
CFSTI Prices: HC $4.00 MF $0.75
LOCKHEED-CALIFORNIA CO BURBANK
AN EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF HYPERSONIC INLET BOUNDARY LAYERS.
Final rept., vol. 1, Jun 62-Nov 64,
by John F. Stroud, and Leonard D. Miller. Aug 65, 110p. Rept. no. LR-18803 vol. 1
Contract AF33 657 8833 Proj. 1366 Task 136605
FDL , TR-65-123 V1

Unclassified report

Descriptors: (*Air scoops, Hypersonic characteristics), (*Turbulent boundary layer, Air scoops), Centrifugal fields, Model tests, Cooling, Wind tunnel models, Compressible flow, Surfaces, Heat transfer

Detailed boundary layer surveys were made on four axisymmetric compression surface models simulating typical hypersonic inlet compression surfaces at free stream Mach numbers ranging from 4 to 8. The four models were designed to provide isentropic compression at design Mach numbers of 5, 6, 8 and 10. The Mach 8 design model had provisions for wall cooling. Quantitative heat transfer measurements were made on the Mach 8 model at free stream Mach numbers of 5, 6, and 8. Two existing turbulent boundary layer theories were modified to account for the various phenomena found to be of importance in hypersonic boundary layers. Theoretical results from these methods were correlated with the experimental data. A significant observation of the present program is the powerful favorable effect of centrifugal force phenomena on boundary layer development in continuous adverse pressure gradients. It was found that these effects become more pronounced with increasing Mach number and reductions in free stream Reynolds number.

AD-621 344 Div. 9/7 ,9/6
CFSTI Prices: HC $7.10 MF $2.00
LOCKHEED-CALIFORNIA CO BURBANK
AN EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF HYPERSONIC INLET BOUNDARY LAYERS. VOLUME II. DATA REDUCTION PROGRAM AND TABULATED EXPERIMENTAL DATA.
Final rept., vol 2, appendix 4, 3 Apr 62-21 Jun 65,
by John F. Stroud, and Leonard D. Miller. Aug 65, 409p. Rept. no. LR-18803 vol. 2
Contract AF33 657 8883 Proj. 1366 Task 136605
FDL , TR-65-123 V2

Unclassified report

Descriptors: (*Air scoops, Hypersonic characteristics), (*Turbulent boundary layer, Experimental data), Wind tunnel models, Model tests, Tables

For abstract see AD-621 343.

AD-621 345 Div. 9/2
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
MICROWAVE MEASUREMENTS ON SHOCK WAVES IN AIR.
Reprint,
by M. Dvir, and W. Low. 1963, 5p. Contract AF61 052 401
AFOSR , 65-1237

Unclassified report

Copies available only to DDC users.

Descriptors: (*Shock waves, Measurement), (*Microwaves, Attenuation), Air, Hypersonic flow, Electrons, Density, Mathematical analysis, Hydrodynamics, Israel

The microwave attenuation by shock waves in air was investigated in the Mach No. range of 8 - 12 and at pressures 1-5 mm Hg. It is shown that an analysis of the time dependence of the attenuation yields important information regarding (a) the maximum electron-density (b) the build-up of the electron density and the beginning of the shock, (c) the electron density near the contact surface, and (d) the length of the heated slug section. An investigation was made of the effect of transitions from a larger diameter shock tube to a smaller tube on the maximum microwave attention, on its time dependence, and on the Mach No. In particular, a study was made of the effect of shorter and larger taper sections as well as abrupt transitions for various Mach Numbers and initial pressures. (Author)

AD-621 368 Div. 9/1 ,2/7
CFSTI Prices: HC $2.00 MF $0.50
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
STEADY AND OSCILLATORY MOTIONS OF A DIFFERENTIALLY HEATED FLUID LOOP.
Technical rept.,
by Pierre Welander. Sep 65, 38p. Rept. no. 65-48
Contract Nonr219600 Proj. NR083 004

Unclassified report

Descriptors: (*Convection, Models (Simulations)), (*Fluid mechanics, Convection), Pipes, Fluid flow, Heating, Cooling, Oscillation, Stability, Thermodynamics

A theoretical study is made of the motion of a closed fluid tube heated from below and cooled from above. It is found that the steady convective motion, in which warm fluid rises in one branch and cold fluid sinks in the other branch of the tube, may become unstable and growing pulsations occur in the system. The result has been obtained by a stability analysis and also verified by direct numerical time integrations on the computer GE 225. (Author)

AD-621 429 See Fld. 20/3

AD-621 430 Div. 9/7 ,9/2
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
AN EXPLORATORY STUDY OF OPEN WAKE EFFECTS UPON THE PRESSURE DISTRIBUTION OF A HYPERSONIC BODY.
Master's thesis,
by George Eugene Thompson. Aug 64, 71p.
Rept. no. GA/AE/64-2

Unclassified report

Descriptors: (*Shock-waves, Injection), (*Wake, Separation), (*Hypersonic characteristics, Pressure), Boundary layer, Ellipsoids, Jets, Model tests, Air, Distribution

High base pressures have resulted in the formation of separation regions on hypersonic bodies. To investigate this occurrence, air was injected against a small flat plate in the wake region of an axially symmetric ellipsoid, and the boundary layer was separated. The tests were conducted in a four-inch hypersonic wind tunnel at Mach numbers of 14 and 17. It was concluded that the effects from side mounted stings were the most probable cause of open wakes. It was necessary to increase the Reynolds number with increasing Mach number if an open wake was to be avoided. Two conditions of laminar boundary layer stability were encountered: One stability condition produced a free-interaction between boundary layer separation and reattachment, while the more stable condition always produced a strong interaction between them. It was noted that the model temperature necessary for the increased stability phase of a laminar boundary layer, decreased with increasing Mach number. The method of air injection used is a simple and effective means by which the boundary layer-shock wave interaction can be investigated along the length of a body. (Author)

AD-621 443 Div. 9/7
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
A WIND-TUNNEL INVESTIGATION OF FORCES ON CONES AT LOW MACH NUMBERS.
Master's thesis,
by David Litwack. Jun 65, 68p. Rept. no. GAM-65B/AE/65-6

Unclassified report

Descriptors: (*Conical bodies, Subsonic characteristics), (*Subsonic characteristics, Conical bodies), Lift, Drag, Pitch (Motion), Angle of attack, Aerodynamic loading, Aluminum, Reynolds number, Reentry vehicles, Model tests

The investigation was conducted to obtain subsonic aerodynamic forces on cones. Nine aluminum cones varying in apex angel from 10 degrees to 90 degrees were tested. Lift, drag and pitching moment were measured at angles of attack varying from -5 deg. to 180 deg. in 10 degree increments and at a dynamic pressure of up to 200 lb./sq. ft. The measured data was first corrected for tare and interference effects; three-dimensional wind-tunnel-boundary-corrections were then applied to correct the data to free-air conditions. This data is presented in graphical form as lift, drag and pitching moment coefficient versus angle of attack for each cone. A plot of drag coefficient versus Reynolds Number at each angle of attack for the 30 degree cone and the 60 degree cone showed the drag almost constant for each angle of attack over the small range of Reynolds Numbers tested (Re = 15,000 to Re = 57,000). The maximum lift to drag ratio for the three smallest cones (10 deg. to 30 deg. cone apex angle) occurred at an angle of attack between 30 deg. to 40 deg.; for every other cone (40 deg. to 90 deg. cone apex angle) the maximum L/D was at an angle of attack between 120 deg. and 130 deg. (Author)

AD-621 446 Div. 9/7
CFSTI Prices: HC $2.00 MF $0.50
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
EXPERIMENTAL INVESTIGATION OF THE CHARACTERISTICS OF FLOW ABOUT CURVED CIRCULAR CYLINDERS.
Technical note,
by Jean Surry. Apr 65, 41p. Rept. no. TN-89
Contract NRC A1894 ,AF AFOSR222 64

Unclassified report

Descriptors: (*Cylindrical bodies, Aerodynamic characteristics), (*Towing cables, Aerodynamic characteristics), Wake, Flow visualization, Force (Mechanics), Aerodynamic loading, Curved profiles, Computers, Distribution, Wind, Canada

The flow and the associated forces on curved circular cylinders, at Reynolds Numbers between 10,000 and 1,000,000, were investigated. The shape and normal force distribution of a flexible curved cylinder were found. Flow visualisation tests and pressure surveys were made on rigid curved cylinders. A comparison was made with earlier results for infinite straight cylinders inclined to the flow. It is concluded that the curvature of a cylinder has a significant effect on the flow and pressure in the wake, and must be considered in the prediction of the aerodynamic forces on such a cylinder. (Author)

AD-621 451 Div. 9/1
CFSTI Prices: HC $4.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
HEAT TRANSFER, NORMAL STRESS, AND SHEAR STRESS FOR A FREE-MOLECULAR GAS IMPINGING ON SEVERAL WALL MODELS.
Master's thesis,
by Harold L. Rogler. Mar 65, 146p. Rept. no. GAM-65A/AE/65-3

Unclassified report

Descriptors: (*Superaerodynamics, Mechanics), (*Stresses, Superaerodynamics), (*Heat transfer, Superaerodynamics), Shear stresses, Models (Simulations), Molecular properties, Continuum mechanics, Force (Mechanics), Kinetic theory, Mathematical analysis, Harmonic oscillators

An analytical study of gas-surface interactions was made in a free-molecular flow; perfectly elastic collisions between the billiard-ball molecules and the surface were assumed and the molecules were governed by a Maxwellian velocity distribution in the free-stream. Normal stress for specular reflection from a stationary boundary was increased as the square of the mass velocity normal to the boundary, while the mass velocities tangential to the boundary had no influence on the normal stress. Normal stress increased as the square of the wall velocity, when the wall velocity squared was small as compared to the local mean square random velocity. Energy was transferred into the gas as a function of the wall speed to the second and fourth powers. Pressure and heat transfer were independent of the vibration frequency. Throughout the study, energy transfer, shear stress, and normal stress were shown to be directly dependent on gas density and the mean-random velocity.

AD-621 485 Div. 9/1
CFSTI Prices: HC $3.00 MF $0.75
CINCINNATI UNIV OHIO DEPT OF AEROSPACE ENGINEERING
STUDIES ON DISSOCIATING GASDYNAMICS. PART III. ON THE DISSOCIATED HYPERSONIC LAMINAR BOUNDARY LAYERS.
Technical rept.,
by Shu J. Hsia, and Ting Y. Li. Jul 65, 84p.
Rept. no. AE-6503
Contract AF AFOSR416 64A
AFOSR , 65-0849

Unclassified report

See also AD-620 352.

Descriptors: (*Dissociation, Gas flow), (*Laminar boundary layer, Dissociation), (*Hypersonic flow, Laminar boundary layer), Nonequilibrium flow, Reviews, Blunt bodies, Flat plate models, Frozen equilibrium flow, Thermodynamics, Transport properties, Mathematical analysis

The purpose of this report is to review some recent advances and to try to gather some useful information from the available literature on the study of laminar boundary layer problems including effects of chemical reactions. To provide a background for the study, the basic relations governing the dissociated laminar boundary layer is outlined briefly. Various methods in analyses of dissociated boundary layer problems are investigated and compared in the flat plate case. Particular attention is directed to the discussion of the effects resulting from the consideration of strong self-induced pressure field, of reacting external inviscid flow and of the thermodynamic properties of the reacting gas mixture. Such considerations are usually neglected for the purpose of simplifying the problems. (Author)

AD-621 515 See Fld. 1/3

AD-621 524 Div. 9/1 ,4/1
CFSTI Prices: HC $4.00 MF $1.00
CASE INST OF TECH CLEVELAND OHIO FLUID THERMAL AND AEROSPACE SCIENCES
A STUDY OF CYCLONIC TWO-FLUID SEPARATION.
Scientific rept.,
by Martin T. Lawler, and Simon Ostrach. Jun 65, 153p. Rept. no. FTAS-TR-65-2
Contract AF AFOSR194 65 Proj. 9781 Task 978101
AFOSR , 65-1523

Unclassified report

Descriptors: (*Fluids, Separation), Centrifuges, Phase studies, Mixtures, Vortices, Gravity, Fuel cells, Power plants (Establishments), Containers

The study presents a consideration of some of the problems of a two-phase flow theory in an effort to consider the problem of the separation of a two-phase fluid mixture in a cyclone separator. A simplified model is proposed and estimates of the rate of discharge of the heavier component are obtained. The discharge mechanisms are discussed and the model indicates the importance of secondary flows in heavy fluid discharge. It indicates that, at most, the secondary flows are only aided by gravity (not due solely to gravity, as it was previously thought. An experimental separator was designed and built. It was operated in an inverted position to indicate that the secondary flow could overcome an unfavorable body force. Tests were run on this cyclone when operating in a normal position to determine the effect of the variation of certain geometric factors and operating conditions on the flow and separation of a two-phase mixture. Separation efficiency and pressure drop information is presented for a wide range of operating conditions and geometric configurations. (Author)

AD-621 525 Div. 9/7
CFSTI Prices: HC $3.00 MF $0.75
MASSACHUSETTS INST OF TECH CAMBRIDGE AEROPHYSICS LAB
EXPERIMENTS ON BLUNT BODY FLOWS WITH CENTRAL INJECTION.
Technical rept.,
by Albert F. Gollnick,Jr.. May 65, 71p. Rept. no. TR-105
Contract AF AFOSR62 407 ,AF AFOSR641 64
AFOSR , 65-1149

Unclassified report

Descriptors: (*Aerodynamic heating, Inhibition), (*Blunt bodies, Hypersonic characteristics), (*Hypersonic flow, Injection), Hypersonic nozzles, Shock waves, Models (Simulations), Axially symmetric flow, Aerodynamic configurations, Surface temperatures, Helium, Jet mixing flow, Supersonic flow, Model tests

Blunt nosed models incorporating axisymmetric contoured injection nozzles were tested at Mach numbers of 7.46 and 4.80. Nozzle contours were computed by means of an inviscid, incompressible analysis and designed to generate hemispherical and ellipsoidal interfaces between the injectant and external flow fields. Shock and interface displacement measurements were in substantial agreement with earlier data, provided a consistent definition of injection mass flow rate was used. Injection produced substantial reductions in equilibrium surface temperatures. Helium proved to be a more effective injectant in this respect than air. In the hypersonic range, Mach number appeared to have no effect on the results. It appeared that in most cases the injectant separated from the nozzle near the throat, producing considerable mixing within the injection cap, accompanied by unsteadiness and asymmetry of the bow shock and interface. It was found that separation data could be correlated on the basis of a previously developed throat flow rate parameter and that separation could be successfully postponed by increasing the throat area. (Author)

AD-621 539 Div. 9/1
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
INTERPRETATION OF TIME SPECTRA MEASURED IN HIGH-INTENSITY SHEAR FLOWS,
by J. L. Lumley. 16 Dec 64, 7p. Contract NOrd16597

Unclassified report

Pub. in Physics of Fluids v8 n6 p1056-62 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Fluid flow, Shear stresses), (*Shear stresses, Fluid flow), Turbulence, Reynolds number, Convection, Differential equations, Time

Fisher and Davies have suggested several mechanisms which can prevent the direct interpretation of time spectra as space spectra by the frozen pattern hypothesis. It is shown that, when various criteria such as that of Lin are satisfied, all but one of these mechanisms, the fluctuation of convection velocity, can be disregarded at high frequencies. An analytical model of this mechanism is constructed and several of its properties examined. On the basis of this model, a correction formula is obtained for the high-frequency part of the one-dimensional streamwise spectrum. This is applied to experimental data taken in a curved turbulent mixing layer. It is found that even under extreme circumstances corrections from the source are not likely to exceed 30%. (Author)

AD-621 559 Div. 9/5 ,8/6
HEBREW UNIV JERUSALEM (ISRAEL) DEPT OF PHYSICS
MICROWAVE ATTENUATION BY SHOCKED HEATED AIR.
Revised ed.,
by M. Dvir, and W. Low. 5 Sep 63, 12p. Contract AF61 052 401 Proj. 9781
AFOSR , 65-1238

Unclassified report

Pub. in Physics of Fluids v7 n4 p578-86 Apr 1964 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 6 Feb 63.

Descriptors: (*Microwaves, Attenuation), (*Shock waves, Radiofrequency interference), Gas ionization, Electron density, Boundary layer, Absorption, Electromagnetic waves, Fluid mechanics

The microwave attenuation of air in Mach range 8-12 is investigated at initial pressures of 5mm Hg. It is shown (a) that the experimental peak attenuation is larger than given by conventional theory; (b) that the time dependence of the attenuation curve gives important information regarding the build-up of the ionization as a function of time, the contact surface and the zone behind it. It is found that the microwave attenuation rises approximately linearly as a function of time to its peak value. The testing time is shorter than that predicted from ideal shock theory but sufficient to establish equilibrium. The electron density changes abruptly upon arrival of the driver gas. However, an appreciable electron density exists over a large region behind the contact surface indicating strong interface mixing. It is also shown that the nature of the surface of the shock tube influences the peak attenuation and the time dependence of this attenuation. (Author)

AD-621 561 Div. 9/1 ,25/1
ROCHESTER UNIV N Y
RECTIFIED DIFFUSION DURING NONLINEAR PULSATIONS OF CAVITATION BUBBLES,
by Anthony Eller, and H. G. Flynn. 5 May 64, 14p. Contract Nonr66818

Unclassified report

Pub. in The Journal of the Acoustical Society of America v37 n3 p493-503 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Acoustics, Cavitation), (*Bubbles, Diffusion), (*Diffusion, Bubbles), (*Cavitation, Acoustics), Gases, Liquids, Fluid mechanics

A gas-filled bubble in a liquid will generally dissolve because of diffusion of gas out of the bubble into the surrounding liquid. However, when set into motion by an acoustic field, a bubble may grow by a process called rectified diffusion. This process can counteract the effect of diffusion for values of the acoustic-pressure amplitude greater than some threshold value. This threshold has been determined by a theory that uses computed radiustime curves for bubbles pulsating nonlinearly rather than assumed infinitestimal, sinusoidal motions. For radius-time curves calculated by a digital computer, this threshold has been computed for a sequence of values of gas concentration, bubble radius, and acoustic frequency. (Author)

AD-621 563 **See Fld. 19/4**

AD-621 571 Div. 9/1 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH
STABILITY DIAGRAMS FOR MAGNETOGASDYNAMIC CHANNEL FLOW.
Flight sciences laboratory rept.,
by F. D. Hains. May 65, 29p. Rept. no. FSL-97 ,D1-82-0438

Unclassified report

Presented at the meeting of the Fluid Dynamics Division of the American Physical Society, Pasadena, Calif. 23-25 Nov 1964. Also available from the author.

Descriptors: (*Magnetohydrodynamics, Stability), (*Fluid mechanics, Magnetohydrogynamics), Fluid flow, Magnetic fields, Reynolds number, Perturbation theory, Differential equations

A study is made of the influence of a coplanar magnetic field on the stability of a conducting fluid flowing between parallel planes. After derivation of the general stability equations for small magnetic Reynolds number, numerical results are obtained for the case where initial perturbations of the magnetic field vanish. This must occur if the channel walls have zero or infinite conductivity. Four sets of stability diagrams are presented so that each stability curve will represent the effect of a given applied magnetic field as only one of the four quantities in the Reynolds number is changed. The flow is always stable for initial disturbances of the field produced by passage of a pulsating current through walls of finite conductivity. (Author)

AD-621 574 **See Fld. 14/2**

AD-621 578 **See Fld. 1/3**

20/6. OPTICS

AD-620 818 Div. 25/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A LENS COMPENSATOR FOR OPTICAL SYSTEMS WITH DOUBLE IMAGES, SUCH AS RANGE FINDERS,
by I. A. Greym. 25 Aug 65, 5p. Rept. no. FTD-TT-65-481
TT , 65-63861

Unclassified report

Unedited rough draft trans. of Russian Patent 165 317, pub. 5 Sep 63, appl. 855624/26-10, 1p.

Descriptors: (*Lenses, Optics), (*Telescope lenses, Optics), (*Optics, Lenses), Range finding, Optical equipment components, Optical images, USSR

In the proposed compensator in order to obtain reduced distances when measuring lines with small angles of inclination, for example with range finders of double image, one of the lenses is freely suspended in front of the second stationary lens in such a way, that the axis of lens suspension is displaced with respect to the sighting axis (optical axis of second stationary lens) by a magnitude, determinable by the given coefficient of the range finder.

AD-620 825 **See Fld. 17/2**

AD-620 847 **See Fld. 5/1**

AD-620 849 Div. 25/4
CFSTI Prices: HC $3.00 MF $0.75
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
TECHNIQUES FOR SUPER-MODE OSCILLATION.
Interim engineering rept. no. 1, 1 Jun-31 Aug 65,
by Russell Targ, S. E. Harris, and B. J. McMurtry. 31 Aug 65, 77p. Contract AF33 615 2884

Unclassified report

Descriptors: (*Lasers, Frequency modulation), (*Modulators, Lasers), Nonochromatic light, Theory, Oscillation, Helium, Neon, Phase-locked systems, Electron optics

The work of this program is divided broadly between two main activities. The first is to obtain a more complete understanding of the physics governing the operation of the FM and super-mode lasers. The second is concerned with improving the techniques for coupling the modes of the FM laser and finding more efficient means for full power supermode conversion of the FM signal to a monochromatic output. An FM modulator was designed and built for incorporation into the laser cavity which is approximately twenty times as efficient as the modulator used successfully in all previous FM experiments. This modulator will permit work with lasers having many more oscillating modes than was previously possible. An external modulator was designed to be used for supermode conversion. This modulator is expected to have ten times the modulating capability of the previous super-mode modulators, allowing work with much higher power lasers. Attempts were made to find alternate techniques for obtaining substantial power at a single frequency.

AD-620 900 **See Fld. 20/3**

AD-620 946 **See Fld. 9/1**

AD-620 963 **See Fld. 3/1**

AD-620 973 Div. 25/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
OPTICAL QUANTUM CRYSTAL GENERATOR WITH EXCITATION BY FAST ELECTRONS,
by N. G. Basov, O. V. Bogdankevich, and A. G. Devyatkov. 15 Jun 65, 8p. Rept. no. FTD-TT-65-555
TT , 65-63914

Unclassified report

Unedited rough draft trans. of Akademiya Nuak SSSR. Fizicheskii Institut, 1964 7p.

Descriptors: (*Semiconductor devices, Lasers), (*Lasers, Electron bombardment), Single crystals, Cadmium compounds, Sulfides, Electron bombardment, Excitation, Intensity, Pumping (Electronics), Line spectrum, USSR

An optical quantum generator (LASER) was obtained pumping a cadmium sulfide single crystal with an electron beam, and its spectrum was studied.

AD-620 978 Div. 25/4 ,25/7
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF ELECTRICAL ENGINEERING
GENERATION OF STOKES AND ANTI-STOKES RADIATION IN RAMAN MEDIA.
Revised ed.,
by H. A. Haus, P. L. Kelley, and H. J. Zeiger. 8 Jan 65, 12p.

Unclassified report

Pub. in The Physical Review v138 n4A pA960-71 May 1965 (Copies not available to DDC or

Clearinghouse customers). Revision of manuscript submitted 11 Aug 64.

Descriptors: (*Lasers, Raman spectroscopy), (*Raman spectroscopy, Lasers), (*Molecular properties, Vibration), Electromagnetic fields, Cavity resonators, Electron transitions, Fluorescence, Ruby

A three-dimensional analysis of stimulated Raman emission is presented for a medium through which a cylindrical laser beam passes. The buildup of the Stokes radiation from the spontaneous fluctuations in the Raman medium is considered. A generalization of the fluctuation-dissipation theorem is derived relating the current-current fluctuations at the Stokes frequency to the laser-induced (negative) conductance at this frequency. The anti-Stokes radiation is treated as arising from the interaction of the laser field and the molecular vibrations accompanying the Stokes radiation. The anti-Stokes radiation emerges in a narrow cone around the familiar phase-matching direction given by B (-) = 2k - B (+), where B (-) and B (+) are the (real parts of the) propagation constants of Stokes and anti-Stokes waves in the medium, and k is the laser propagation vector. The angular width of the anti-Stokes radiation cone is evaluated. (Author)

AD-621 012 Div. 25/4 ,25/7
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ELECTRON PARAMAGNETIC RESONANCE SPECTROMETER WITH FREQUENCY AND MAGNETIC-FIELD MODULATION,
by Tuong Tai-Chian. 25 Jun 65, 17p. Rept. no. FTD-TT-64-1102
TT , 65-63937

Unclassified report

Edited trans. of Wu Li Hsueh Pao (Chinese People's Republic) v19 n12 p816-23 1963.

Descriptors: (*Spectrum analyzers, Paramagnetic resonance), (*Paramagnetic resonance, Spectrum analyzers), Frequency modulation, Magnetic fields, Modulation, Sensitivity, Signal-to-noise ratio, China

A new electron paramagnetic resonance spectrometer is described. Its distinctive characteristic is the use of combined frequency-and magnetic-field modulation. Its structure is simplified as a result. Due to the use of magic tee balance adjustment and application of a positive bias voltage to the microwave crystal diode, its noise level is reduced almost that of thermal noise. It has increased detection efficiency and higher sensitivity. The signal of 5 x 10 to the -9th power molar DPPH can be observed on the oscilloscope. The signal-to-noise ratio is 2:1. The working frequency is 9690 Mc. (Author)

AD-621 036 **See Fld. 20/12**

AD-621 046 **See Fld. 8/2**

AD-621 053 **See Fld. 17/2**

AD-621 110 Div. 25/4
SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN
EXCITATION AND INVERSION MECHANISMS IN GAS LASERS,
by W. R. Bennett,Jr.. 1964, 17p. Contract DA31 124ARO D124
AROD , 4313:8

Unclassified report

Pub. in Annals of the New York Academy of Sciences, v122 art2 p579-95 May 28 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Gases), Pumping (Electronics), Excitation, Atomic energy levels, Electron transitions, Quantum mechanics

AD-621 114 Div. 25/4 ,25/6
LINCOLN LAB MASS INST OF TECH LEXINGTON
SEMICONDUCTOR LASERS.
Meeting speech,
by Benjamin Lax. 28 May 65, 12p. Rept. no. MS-779E
Contract AF19 628 5167
ESD , TDR-65-319

Unclassified report

Pub. in Annals of the New York Academy of Sciences, v122 article2 p598-607 May 28 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Diodes (Semiconductors)), (*Diodes (Semiconductor), Lasers), Semiconductor devices, Gallium alloys, Arsenic alloys, Magnetic properties, Light communication systems, Infrared equipment, Radar equipment

Semiconductor lasers are the most recent additions to the growing family of these new coherent sources of light. Although their conception is almost ten years old, the technology was not sufficiently advanced until two years ago when highly efficient luminescent diodes of gallium arsenide were discovered. The development of the laser itself by the groups at General Electric, IBM, and Lincoln Laboratory shortly afterwards was readily foreseen. Today the preoccupation of many industrial, university, and government laboratories with research and development has given rise to many publications, which indicate a lively interest and promising future for these devices. The activity is well balanced between the basic physics and the applied. (Author)

AD-621 204 Div. 25/4 ,8/2
LINCOLN LAB MASS INST OF TECH LEXINGTON
PROPERTIES OF THE PBSE DIODE LASER,
by Jack F. Butler, Arthur R. Calawa, and Robert H. Rediker. 18 Jan 65, 4p. Rept. no. JA-2517
Contract AF19 628 5167
ESD , TDR-65-430

Unclassified report

Pub. in IEEE Journal of Quantum Electronics, vQE-1 n1 p4-7 Apr 1965. (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Diodes (Semiconductor)), (*Diodes (Semiconductor), Lasers), (*Lead alloys, Selenium alloys), Infrared communication systems, Infrared windows, Haze, Attenuation, Crystal structure, Heat treatment, Infrared spectroscopy

Diode laser action has been obtained at 8.5 microns with PbSe. This laser is of potential interest for terrestrial communications since its emission is in the 8-to-14microns atmospheric window, a spectral region of high atmospheric transparency where attenuation due to scattering by haze is low. Fabrication techniques are described which are based on controlling carrier type and concentration by adjusting the Pb:Se ratio. Below threshold for laser action, the emission exhibits two spectral peaks, one near 8.5 microns which increases superlinearly with current and another near 10.1 microns which increases slowly with current. Laser action associated with the 8.5 microns peak is observed above a threshold current density of 2000 A 1/cm-sq. From measurements which did not resolve the cavity mode structure, the emission peak was found to shift to higher energies in a (100) oriented magnetic field at the rate of 7.1 X 10 to the -8th power eV per gauss, or 17 Mc/s per gauss. This is the expected shift if the emission is associated with band-to-band transitions. The threshold current decreased to a fraction of its zero field value in a magnetic field of approximately 10 kilogauss, then increased slowly with higher fields. (Author)

AD-621 208 Div. 25/4 ,25/5
LINCOLN LAB MASS INST OF TECH LEXINGTON
OPTICALLY PUMPED INAS LASER,
by Ivan Melngailis. 18 Mar 65, 4p. Rept. no. JA-2542A
Contract AF19 628 5167
ESD , TDR-65-437

Unclassified report

Pub. in IEEE Transactions on Quantum Electronics vQE1 n2 p104-5 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Lasers, Pumping (Electronics)), Indium alloys, Antimony alloys, Crystals, Excitation, Photoelectric effect, Light pulses, Quantum mechanics

Laser action has been obtained in InAs samples excited by means of GaAs p-n junction laser. Assuming the creation of one electron-hole pair per photon absorbed in the excited samples, the thresholds for laser action are consistent with those obtained in InAs diode lasers. In contrast to most InAs diode lasers which emit in a conduction-band to acceptor line (0.398 eV) the emission from optically excited n-type InAs corresponds to a bandto-band transition (0.413 eV). Since the energy of the diode emission agrees closely with the energy of the photoluminescence from Zn doped p-type InAs, the diode emission appears to emanate from the p-type side of the junction where injected electrons recombine via a Zn acceptor level. (Author)

AD-621 227 Div. 25/4 ,14/4
CFSTI Prices: HC $4.00 MF $0.75
AMERICAN OPTICAL CO SOUTHBRIDGE MASS RESEARCH DIV
FURTHER STUDY OF GLASS FIBER LASERS FOR OPTICAL DATA PROCESSING.
Final technical rept. for Apr 64-Apr 65,
by Charles J. Koester. Aug 65, 112p. Rept. no. AORC-4502-16-564-42
Contract AF30 602 3389 Proj. 5581 Task 558101
RADC , TR-65-237

Unclassified report

Descriptors: (*Lasers, Glass textiles), (*Glass textiles, Lasers), Glass, Neodymium, Impurities, Digital systems, Computer logic, Pulse generators, Oscillation, Diodes (Semiconductor), Data processing systems

Investigations were undertaken to find laser effects which can be useful in optical logic functions, and to devise techniques for further development of the effects. The emphasis was on neodymium doped glass and fiber lasers. A technique was developed for generating two pulses of laser energy of submicro-second duration and variable time separation from 0.3 to 1 microsecond. The technique can be refined to yield order-of-magnitude improvement in both minimum and maximum time separation. Beveling the ends of fiber lasers was investigated as a technique for controlling oscillation modes. As the bevel angle was increased, oscillation modes were shifted from near axial to higher order, the latter giving a hollow cone output pattern. Interactions of light from a GaAs diode laser with a pumped neodymium fiber laser were investigated. It was found that the pumped laser material acts as an excited state absorber for the 0.84 micron radiation from the diode laser. Positive steps were taken toward an optical Y junction consisting of high index glass channels imbedded in low index glass. Equations governing the behavior of a saturable absorber in fiber form have been derived. A fiber laser, consisting of a passive glass core and a neodymium doped cladding, was made to lase. (Author)

AD-621 308 Div. 25/4 ,20/3 ,25/6
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
FAST NEUTRON IRRADIATION-EFFECTS ON GAAS (1-X)P (X) P-N DIODE LASER THRESHOLD CURRENTS,
by J. H. Doede, R. H. Vonderohe, N. Holonyak, C. J. Nuese, and C. M. Wolfes. 1965, 5p. Con-

tract AF49 638 417 Proj. 9763 Task 976302
FOSR , 65-1377

Unclassified report

Pub. in Journal of Applied Mathematics and Physics v16 pt1 p99-100 1965 (Copies available only to DDC users).

Descriptors: (*Lasers, Diodes (Semiconductor)), (*Radiation damage, Diodes (Semiconductor)), (*Electric currents, Lasers), Fast neutrons, Gallium alloys, Arsenic alloys

Two of the major problems associated with the construction of laser diodes from ternary system material are the chemical purity and the inhomogeneous polycrystalline nature of the final product. Both effects increase the current density necessary for laser action. In this investigation, 4 GaAs (1-x)P (x) diodes of various phosphorus substitution percentages were bombarded with fast neutrons in order to determine the dependence of threshold current densities on the total neutron flux. It appeared that surface damage effects of the laser cavity masked any information concerning the crystalline homogeneity effects on laser current thresholds. Present investigation is being made of irradiations of the initial crystal material and subsequent polishing into laser cavities to remove such surface effects. (Author)

AD-621 315 **See Fld. 7/4**

AD-621 319 Div. 25/4 ,25/7
CFSTI Prices: HC $5.00 MF $1.00
CALIFORNIA INST OF TECH PASADENA QUANTUM ELECTRONICS LAB
SPONTANEOUSLY RADIATING ATOM IN CAVITY FIELDS.
Scientific rept.,
by C. J. Buczek. Apr 65. 157p. Rept. no. SR-4
Contract AF49 638 1322
AFOSR , 65-1000

Unclassified report

Descriptors: (*Electron transitions, Electromagnetic fields), (*Lasers, Electron transitions), Atomic properties, Quantum mechanics, Field theory, Magneto-optic effect, Atomic energy levels, Photons

The characteristics of spontaneous emission from an atom which interacts with a coherent light wave are determined. The competition between coherent photons and spontaneous photons is treated in detail for a system consisting of a stationary atom, an open ca ity and spatial fields. It is found that the interaction with the coherent field modifies the spectral distribution of spontaneous radiation from the atom. For spontaneous transitions involving an atomic state which interacts with the coherent field, the spectral distributions can no longer be described by Lorentzian functions. The new distributions exhibit a broadening and splitting for strong interactions between the atom and the coherent field. It is shown that the qualitative features of these new distributions can be predicted from the energy-level diagram of the atom-cavity system. The net probability of the system gaining a coherent or cavity photon is calculated by integrating over the emitted spontaneous frequencies. The equivalence of this approach to the method of computing probabilities by integrating over time is demonstrated by using Parseval's theorem. (Author)

AD-621 320 Div. 25/4
CFSTI Prices: HC $6.00 MF $1.25
CALIFORNIA INST OF TECH PASADENA QUANTUM ELECTRONICS LAB
NONLINEAR EFFECTS IN TRAVELING WAVE LASER AMPLIFIERS.
Scientific rept.,
by D. H. Close. May 65, 218p. Rept. no. SR-5
Contract AF49 638 1322
AFOSR , 65-0999

Unclassified report

Descriptors: (*Lasers, Theory), Refractive index, Gain, Doppler effect, Motion, Partial differential equations, Field theory, Perturbation theory

Using semiclassical radiation theory, a formalism similar to that used by Lamb in his 'Theory of an Optical Maser' is developed for studying the amplification of vector traveling waves in a laser-type medium. The effect of the medium on the waves is given in terms of space (or time) dependent field amplitudes and phases and a nonlinear index of refraction. With particular emphasis on typical gaseous media, the effects of Doppler broadening are treated in detail for arbitrary ratios of natural to Doppler linewidths. Polarization and propagation vectors in various directions are considered, and the nonlinear effects are found to make an isotropic medium effectively anisotropic. Lowest order nonlinear effects (due to a polarization cubic in the field amplitudes) are studied extensively, and the frequency dependence of several of these processes is presented in graphical form. In particular, the introduction of fields at new frequencies and polarization effects are considered. The characteristics of these nonlinear processes peculiar to Doppler broadened lines are discussed, and the processes are interpreted in terms of saturation and coherent modulation of the population inversion density.

AD-621 389 Div. 25/4
HARVARD UNIV CAMBRIDGE MASS
HYDROGEN-MASER PRINCIPLES AND TECHNIQUES,
by D. Kleppner, H. C. Berg, S. B. Crampton, and N. F. Ramsey. 17 Dec 64, 12p.

Unclassified report

Pub. in Physical Review v138 n4A pA972-83 May 17 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Masers, Hydrogen), Operation, Design, Microwave frequency, Standards, Cavity resonators, Magnetic fields

Techniques and design principles relevant to the construction and operation of a hydrogen maser are presented in detail. These include methods for the generation of atomic hydrogen, state selection, design of the microwave cavity, production of very low magnetic fields, coating the hydrogen storage bulb, and tuning the maser. A figure of merit is introduced which indicates the optimum choice of parameters. (Author)

AD-621 405 **See Fld. 3/1**

AD-621 416 **See Fld. 20/10**

AD-621 444 **See Fld. 3/1**

AD-621 488 Div. 25/4 ,25/6
CFSTI Prices: HC $4.00 MF $1.00
MICROWAVE LAB STANFORD UNIV CALIF
LASER MATERIAL (SPECTROSCOPY).
Semiannual rept. no. 1, 15 Dec 64-15 Jun 65.
Jul 65, 135p. Rept. no. ML-1346
Contract DA28 043AMC00446E Proj. DA1P6 22001A056 Task DA1P6 22001A05603

Unclassified report

Descriptors: (*Semiconductors, Lasers), (*Lasers, Materials), Zinc compounds, Sulfides, Impurities, Rare earth elements, Terbium, Neodymium, Thulium, Dysprosium, Erbium, Yttrium, Argon, Garnet, Luminescence, Electroluminescence, Single crystals, Pumping (Electronics), Spectra (Visible + ultraviolet), Oscillators

The line structure of the photoluminescence of ZnS:Tb, ZnS:Nd, ZnS:Tm and ZnS:Dy has been studied under various preparative conditions. There is a strong tendency for rare earth pairing with other lattice defects in the presence of excess S. This pairing is manifested by the appearance of new emission and excitation bands. Of the many distinct sites for the rare earth ion, one seems to stand out as most important in electroluminescence although it gives only a minor contribution to the photoluminescence. Using a variety of luminescent phenomena, we are able to count at least four distinct sites for trivalent rare earth ions in ZnS and there is strong evidence that more exist. Preparation of CdS:Nd has been achieved so that reasonably strong Nd (3+) emission is obtained. A multiplicity of Nd (3+) sites is evident. Emission of CdS:Er has also been observed. Tunnel injecting contacts have been formed on slices of a single crystal of CdS:Nd. The belowthreshold oscillation spectral width is derived. The above-threshold spectral width due to phase fluctuations in the oscillator output is given. The above-threshold spectral width due to amplitude fluctuations (the AM contribution to the spectral width) is given. A practical Nd:YAG CW laser system has been designed and built. An aluminized glass, cylincrical cavity was used, and a linear tungsten filament, ASA-DXN 1000 watt lamp was used as an optical pump. The laser threshold was between 900 and 1000 watts. (Author)

AD-621 535 **See Fld. 3/1**

AD-621 556 Div. 25/4 ,25/6
CFSTI Prices: HC $3.00 MF $0.50
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
A THRESHOLD ANALYSIS OF THE TUNNEL INJECTION LASER.
Interim technical research rept.,
by C. Wheeler. Jul 65, 54p. Rept. no. EERL-42
Contract DA31 124ARO D364 Proj. A20014501B11B,AROD 5560E

Unclassified report

Descriptors: (*Tunnel diodes, Lasers), (*Lasers, Semiconductors), (*Diodes (Semiconductor), Lasers), (*Semiconductors, Lasers), Gallium alloys, Arsenic alloys, Photons, Propagation, Attenuation, Gain, Optics, Solid state physics, Injection

A new threshold analysis of the tunnel injection laser is given that differs from previous treatments in that an additional loss mechanism is considered. This new loss mechanism, a result of the attenuation the photon wave suffers because of the power loss in the confining metal boundaries, causes a slight increase in the threshold current density of the tunnel laser. For a device one millimeter long composed of GaAs at 77K, the threshold current is 54 A/sq cm. The analysis of the loss suggests a modification of the originally proposed thickness of the semiconductor wafer. In order that a lasing mode propagate with negligible power loss in the metal boundaries, the thickness of the semiconductor region should be increased to ten microns. This would facilitate the fabrication of the wafer, but may result in a pulsed output. (Author)

AD-621 572 Div. 25/4
CFSTI Prices: HC $2.00 MF $0.50
YALE UNIV NEW HAVEN CONN
CYCLOTRON RESONANCE INTERACTION OF MICROWAVES WITH ENERGETIC ELECTRONS.
Final rept. for 15 Mar 63-15 Mar 65,
by J. L. Hirshfield, I. B. Bernstein, and J. M. Wachtel. 19 Jul 65, 36p. Contract AF19 628 2448 Proj. 4645 Task 464501
AFCRL , 65-549

Unclassified report

Descriptors: (*Masers, Cyclotron resonance phenomena), (*Cyclotron resonance phenomena, Electrons), Microwave frequency, Gain, Electron transitions, Perturbation theory, Quantum mechanics, Cavity resonators, Transport properties

Quantum mechanical and classical descriptions of microwave interactions with energetic electrons near cyclotron resonance which underlie the gain

mechanism in the electron cyclotron maser are reviewed. Experimental studies designed to test the theory are discussed. A perturbation calculation is given which includes systematically the effects of rf electric and magnetic forces, and finite transit time for electrons in the TE (0 11) cavity used in the experiments. Non-linear extension of the theory which lead to estimates of the saturation level of this maser are discussed. (Author)

AD-621 577 **See Fld. 9/2**

AD-621 595 **See Fld. 14/5**

20/8. PARTICLE PHYSICS

AD-620 843 **See Fld. 7/3**

AD-620 844 **See Fld. 7/4**

AD-620 845 Div. 20/1
CFSTI Prices: HC $1.00 MF $0.50
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
ELECTRON IMPACT EXCITATION OF THE 2P STATE OF ATOMIC HYDROGEN.
Scientific rept.,
by K. L. Bell. 1965, 8p. Rept. no. SR-6
Contract AF61 052 780
AFCRL , 65-651

Unclassified report

Descriptors: (*Excitation, Hydrogen), (*Electron bombardment, Hydrogen), (*Hydrogen, Excitation), Atomic energy levels, Great Britain

A discrepancy in the analysis of Corinaldesi and Trainor is pointed out and it is shown that the correct procedure leads to a non-vanishing expression for the exchange scattering amplitude given by the BornOppenheimer approximation for excitation of the m = =1 levels of the 2p state of atomic hydrogen by electron impact. This expression is employed to correct earlier calculations of the is ' - 2p excitation total cross-section. (Author)

AD-620 846 Div. 25/7
CFSTI Prices: HC $1.00 MF $0.50
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
THE GROUND STATE OF THE HYDROGEN MOLECULE.
Scientific rept.,
by M. R. Flannery. 1965, 4p. Rept. no. SR-7
Contract AF61 052 780
AFCRL , 65-652

Unclassified report

Descriptors: (*Hydrogen, Molecular properties), (*Ground state, Hydrogen), Functions, Great Britain

Weinbaum's treatment of the 1 $\Sigma g+$ state of H2 is adapted to calculate the ground state electronic wave function at several internuclear distances. (Author)

AD-620 851 Div. 25/7 ,27/3
CFSTI Prices: HC $1.00 MF $0.50
GENERAL DYNAMICS/CONVAIR SAN DIEGO CALIF
SPECTRAL EMISSIVITY MEASUREMENTS OF THE 4.3 - MICRON CO2 BAND BETWEEN 2650 AND 3000 K.
Technical rept. on proj. DEFENDER,
by C. C. Ferriso, C. B. Ludwig, and L. Acton.
Aug 65, 15p. Rept. no. GD/C-DBE65-017
Contract Nonr390200

Unclassified report

Descriptors: (*Emissivity, Band spectrum), (*Carbon dioxide, Spectra (Infrared)), (*Spectra (Infrared), Emissivity), Molecular spectroscopy, High-temperature research, Reentry vehicles, Exhaust gases, Heat transfer

Spectral emissivity measurements of the 4.3-micron CO2 band were made at high temperatures. Under the conditions of the present experiments, the fine structure in the 4.3-micron CO2 spectrum is smeared out and comparable with a weak line band model calculation. A comparison of the observed spectral emissivities with theoretical band model calculations shows good agreement. The measured integrated intensity of the 4.3-micron CO2 band between 2650 and 3000 K is 2850 (1/cm/per cm at STP) and agrees well with measured room temperature values. (Author)

AD-620 864 Div. 20/2 ,25/3 ,20/5
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INVESTIGATION OF CONTROLLED NUCLEAR FUSION AND HIGH-TEMPERATURE PLASMA PHYSICS,
by L. A. Artsimovich. 9 Aug 65, 26p. Rept. no. FTD-TT-65-961
TT , 65-63874

Unclassified report

Unedited rough draft trans. of Atomnaya Energiya (USSR) v17 n4 p269-78 1964.

Descriptors: (*Thermonuclear reactions, Control), (*Plasma physics, Thermonuclear reactions), Hightemperature research, Thermal insulation, Magnetic pinch, Plasma oscillations, Magnetrons, Nuclear power plants, Deuterium, Tritium, USSR

Experimental and theoretical developments in the control of nuclear fusion reactions as plasmas of temperatures of hundreds of millions of degrees are discussed. Thermal insulation by means of magnetic fields is discussed. Successful control of nuclear fusion would allow the use of deuterium and tritium as nuclear fuel for power applications.

AD-620 865 **See Fld. 20/3**

AD-620 903 Div. 25/7
CFSTI Prices: HC $1.00 MF $0.50
CHICAGO UNIV ILL LABORATORY OF MOLECULAR STRUCTURE AND SPECTRA
MOLECULAR STRUCTURE AND SPECTRA.
Quarterly status rept. no. 33, 1 Jan-31 Mar 65.
31 Mar 65, 8p. Contract Nonr212101 Proj. NR014 101

Unclassified report

Descriptors: (*Molecular structure, Molecular spectroscopy), (*Molecular spectroscopy, Molecular structure), Electron transitions, Band spectrum, Helium, Chlorine

Theoretical and experimental work in the field of molecular structure and spectra is summarized with the general purpose of obtaining a better and more quantitative understanding of the spectra and energy levels of molecules and of the foundations of structural chemistry.

AD-620 939 **See Fld. 7/4**

AD-620 942 **See Fld. 7/2**

AD-620 978 **See Fld. 20/6**

AD-620 991 **See Fld. 7/2**

AD-621 006 Div. 20/2 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
ATOMIC ENERGY (SELECTED ARTICLES).
28 Jun 65, 44p. Rept. no. FTD-TT-65-162
TT , 65-63931

Unclassified report

Unedited rough draft trans. of Atomnaya Energiya (USSR) v17 n3 p177-84, 185-8, 211-5, 217-9 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Magnetism, Scientific research), (*Electric discharges, Plasma physics), Magnetic fields, Plasma medium, X-rays, Neutrons, Particle accelerator techniques, Beta particles, USSR

Contents: Effect of a transverse magnetic field on a toroidal discharge in an intensive longitudinal magnetic field, by B. M. Grigorovich and V. S. Mukhovatov; On the mechanism of x-ray and neutron radiation of powerful pulsed discharges, by M. D. Rayzer and V. N. Tsytovich; Magnetic field of corkscrew configuration growing along the radius, by Yu. V. Martynenko and R. I. Sobolov; The passing of beta-particles through a substance, by K. K. Aglintsev and V. P. Kasatkin.

AD-621 012 **See Fld. 20/6**

AD-621 017 **See Fld. 7/4**

AD-621 023 Div. 25/7 ,20/2 ,30/2
CFSTI Prices: HC $5.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
PREDICTION OF THE TIME DEPENDENT BETA SPECTRUM FROM A NUCLEAR WEAPON DETONATION.
Master's thesis,
by James E. Dieckhoner. Aug 65, 187p. Rept. no. GNE/Phys/65-3

Unclassified report

Descriptors: (*Beta-ray spectrum, Fission products), (*Fission products, Beta-ray spectrum), (*Nuclear weapons, Detonations), Programming (Computers), Beta decay

This thesis develops a method by which the time dependent beta spectrum from four different types of nuclear and thermonuclear fission can be predicted. From the mass chain yield and the Equal Charge Displacement theory, the initial isotopic concentrations are predicted. The time dependent relationships within each mass chain are solved exactly. The shape of the beta decay spectra for each isotope is predicted by use of the Fermi theory. An estimation technique is used to predict the spectra from isotopes with unknown decay schemes. Attempts are made to predict the percent of the total available decay energy which is accounted for by beta decay, for those isotopes with unknown decay schemes. These procedures are combined in a set of computer programs written for the IBM 7044. The spectra predicted using the programs are compared with West's experimental results and agree within a factor of 1.4. (Author)

AD-621 054 Div. 20/1 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
STUDYING A CHARGED PARTICLE, INTERSECTING A METAL SCREEN,
by D. M. Sedrakyan. 28 May 65, 13p. Rept. no. FTD-TT-65-117
TT , 65-63954

Unclassified report

Unedited rough draft trans. of Akademiya Nauk Armyanskoi SSR, Erevan. Izvestiya. Seriya Fiziko-Matematicheskikh Nauk, v17 n1 p113-21 1964.

Descriptors: (*Charged particles, Electromagnetic radiation), Particle trajectories, Electric fields, Magnetic fields, USSR

Consideration is given to radiation originating at the intersection between a charged particle and an ideal conductive semiplane at a given distance from the edge of the semiplane. Present is, on one hand, radiation of a charged particle intersecting a screen and connected with diffraction of its field by a metal screen, and on the other hand, corrections to transient radiation of the charged particle in the presence of screen edge.

AD-621 069 Div. 25/7 ,24/2 ,8/4
CFSTI Prices: HC $1.00 MF $0.50
MICHIGAN UNIV ANN ARBOR DEPT OF PHYSICS
THE USE OF IMAGE INTENSIFIERS WITH STREAMER CHAMBERS.
Technical rept.,
by Lawrence W. Jones, and Billy W. Loo. Sep 65, 22p. Rept. no. TR-20 ,03106-20-T
Contract Nonr122423 Proj. 03106
Unclassified report

Descriptors: (*Image intensifiers (Electronics), Spark shadowgraph photography), (*Spark shadowgraph photography, Image intensifiers (Electronics)), (*Ionization chambers, Spark shadowgraph photography), (*Particle trajectories, Photographic techniques), Nuclear physics, Radiation measurement systems, Gas discharges

A very simple Marx generator and a streamer chamber with an active volume of 9 in x 6 in x 9/4 in. Streamers of any length down to less than one mm. may be obtained by adjusting the firing delay of a spark gap which shunts the chamber. With the aid of a three stage image intensifier, cosmic ray tracks were successfully recorded on 35 mm. Kodak Tri-X film. Streamers of 5 mm. were recorded comfortably with a front lens opening of f/16 while the much fainter 1 mm. streamers require an opening of f/4.5 or less. A coincidence pulse from the counters located above and below the chamber initiates the triggering functions of the avalanch transistor, the EFP60, and the 5D21 tube which delivers a 7 kv pulse to the trigger electrode of the first stage of the Marx generator. The 101 mm. Wollensak lens images onto the first cathode of the tube the direct view of the streamers normal to the electric field together with the end view, which is parallel to the field and is reflected to the lens by means of a mirror. A pair of 76 mm. f/0.87 Super Farron lenses couples the output of the image intensifier to the film with unity magnification, while the demagnification of the entire system is about 10:1.

AD-621 076 See Fld. 20/2

AD-621 090 Div. 25/7 ,25/5
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
LAGRANGIAN THEORY FOR THE SECOND-RANK TENSOR FIELD,
by K. J. Barnes. 26 Aug 64, 7p.
Unclassified report

Pub. in Journal of Mathematical Physics v6 n5 p788-94 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Tensor analysis, Field theory), (*Field theory, Tensor analysis), Spin, Particles, Bosons, Quantum mechanics, Operators (Mathematics)

The second-rank field is decomposed into its various subspaces under the Lorentz group and the appropriate projection operators are exhibited explicitly. The most general local, Hermitian, free-field Lagrangian which can be formed from this field is written down, and the corresponding equations of motion and subsidiary conditions are derived by means of a variational principle. Finally some possible applications of this theory are discussed (in particular spin-2 boson theory), and all the possible couplings of this field to a Dirac particle are listed in full.

AD-621 091 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
FORM FACTORS IN ELECTRON-TRINUCLEON SCATTERING,
by J. S. Levinger, and B. K. Srivastava. 1 Sep 64, 6p.
Unclassified report

Pub. in Physical Review v137 n2B pB426-31 25 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nuclear scattering, Electrons), Elastic scattering, Helium, Nuclear spins, Nuclear energy levels, Neutrons

The four form factors in electron-trinucleon (e-H3 or e-He3) elastic scattering are analyzed using two alternative sets of four unknowns: (i) the neutron electric form factor, the form factor F for the dominant S state and the isovector- and isocalar-exchange magnetic form factors-neglecting the mixed symmetry S' state; (ii) the form factors for odd and like nucleons, and the isovector- and isocalar-exchange magnetic form factors--assuming knowledge of the neutron electric form factor, essentially 0.02 q-squared. The first alternative gives positive neutron electric form factors that seem somewhat high; the second alternative gives a plausible value of 1% for the probability of the mixed-symmetry S' state, and also gives a reasonable shape for the isovector-exchange form factor. The isocalar-exchange form factor stays less than 0.06 nm. Good agreement is found between results for F and calculations based on three different wave functions adjusted to give the experimental Coulomb energy. (Author)

AD-621 092 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
PHOTODISINTEGRATION OF THE TRITON WITH VELOCITY-DEPENDENT POTENTIALS,
by B. K. Srivastava. 7 Aug 64, 4p.
Unclassified report

Pub. in Physical Review v137 n1B pB71-4 Jan 11 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Photonuclear reactions, Tritons), (*Tritons, Photonuclear reactions), Potential theory, Velocity, Nuclear binding energy, Calculus of variations, Bremsstrahlung, Nuclear cross sections

The sum rules of Levinger and Bethe to calculate the integrated cross section a and the bremsstrahlungweighted cross section b for the photodisintegration of the triton, using the wave function and two-body velocitydependent central potentials both for 1S and 3S states. The values of the wavefunction parameters are those determined from a variational calculation of the binding energy of the triton. Our values of a and b agree reasonably well with those of Mathur et al. obtained by using hard-core wave functions and potentials, and also with the experimental values of Gorbunov et al. (Author)

AD-621 095 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
NEUTRON FORM FACTORS FROM INELASTIC ELECTRON-DEUTERON SCATTERING,
by C. W. Akerlof, K. Berkelman, G. Rouse, and M. Tigner. 20 Mar 64, 6p.
Unclassified report

Pub. in Physical Review v135 n3B p810-5 Aug 10 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Deuteron reactions, Inelastic scattering), (*Electrons, Deuteron reactions), Neutron scattering, Nuclear binding energy, Differential cross section

The differential cross section for quasielastic scattering of electrons from neutrons initially bound in deuterium has been measured at 90 deg and 120 deg laboratory angle for values of the four-momentum transfer squared equal to 11, 15, 20, 25, and 35 deg. The yield of momentum analyzed scattered electrons was measured using CD2, CH2, and C targets. The Durand theory for the effects of deuteron binding is used to extract experimental values for the ratio of the electron-neutron and electron-proton differential cross sections. Over most of the range of the experiment the ratio is between 0.3 and 0.5. The neutron form factors obtained are consistent with previous measurements at lower momentum transfer. (Author)

AD-621 096 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
SHOWERS IN LEAD PRODUCED BY ELECTRONS WITH ENERGIES FROM 300 MEV TO 1BEV,
by H. Thom. 12 Mar 64, 9p.
Unclassified report

Pub. in Physical Review v136 n2B pB447-55 Oct 26 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Cloud chambers, Secondary emission), (*Lead, Secondary emission), (*Secondary emission, Lead), (*Electrons, Secondary emission), Monte Carlo method, Photons, Probability

The behavior of electron-initiated showers in a leadplate expansion cloud chamber was measured for primary energies of 277, 528, 845, and 990 MeV, in terms of the secondary electrons with angles within about 60 deg of the shower axis. Empirical formulas are derived from the experimental data, for characteristic average shower quantities as functions of primary energy. Expected standard errors in determining energies of individual showers by measuring the various quantities are also given. A new tabulation of the results of Wilson's Monte Carlo calculations is given for primary electrons and photons with energies from 50 to 300 MeV. The average numbers of electrons with energies greater than 8 and 10 MeV given in this paper correct the originally published curves and are in good agreement with the results of Crawford and Messel. Approximate comparison is made between the experimentally measured shower behavior and the calculated behavior, and good agreement is found. (Author)

AD-621 099 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
RELATIVISTIC CALCULATION OF THE DEUTERON ELECTROMAGNETIC FORM FACTOR. II,
by Franz Gross. 25 May 64, 22p.
Unclassified report

Pub. in The Physical Review v136 n1B pB140-61 Oct 12 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Deuteron reactions, Relativity theory), Electromagnetic properties, Potential theory, Meson reactions, Pions, Quantum mechanics, Nuclear magnetic moments, Probability

The deuteron form factor is calculated in a one-pionexchange (OPE) approximation using single-variable unsubtracted dispersion relations in the squared-momentum-transfer variable. As a first step, the imaginary parts of the form factors are presented in terms of the four invariants of the deuteron-nucleon (d-N) vertex. The resulting equations are compared in detail with similar expressions obtained from the Jankus potential theory, and a clear understanding of the precise way in which the d-N invariants play the role of the deut-

eron wave function emerges, enabling us to obtain relativistic wave functions. This comparison also shows the presence of new relativistic terms not included in the Jankus results (in particular, a new term appears in the magnetic moment). Then, the imaginary parts of the d-N vertex invariants are calculated numerically. In this calculation the OPE contribution in its anamalous region is calculated exactly, while the contributions above the normal threshold are obtained by an educated guess based on sum rules which the invariants are assumed to satisfy. Finally, using these results, the form factors are calculated numerically. With the assumption of unsubtracted dispersion relations, it is necessary to assume only the charge and mass of the deuteron, and the pion-nucleon coupling constant, in order to completely determine the form factors. The numerical results for the magnetic and quadrupole moments agree with experiment to within 2%; the D-state probability if 5.5% but is not very reliably determined, and the other results, while less good, are still quite reasonable. (Author)

AD-621 100 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
THREE-BODY CORRELATIONS IN NUCLEAR MATTER,
by H. A. Bethe. 5 Jan 65, 19p.
Unclassified report

Pub. in The Physical Review v138 n4B pB804-22 May 22 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*N-body problem, Nuclei), (*Nuclear forces, Correlation techniques), Perturbation theory, Potential theory, Nuclear binding energy, Series, Integrals

The energy of nuclear matter which is due to the simultaneous interaction of three nucleons is calculated to all orders of Goldstone perturbation theory. The various orders form a divergent series with alternating signs. This series is summed by an integral equation due to Faddeev, and an approximate solution of this equation is found. According to this solution, the effect of the repulsive core on the potential energy of 'particle' states is reduced to about one-third as compared with the usual third-order calculation, while the long-range attraction is essentially unchanged. The total potential energy of the important excited particle states is thereby reduced essentially to zero. Similarly, the total effect of threebody correlations on the energy of nuclear matter is very small, of the order of 3 to 6% of that of the two-body correlations. Thus the Goldstone series, if rearranged into a series in the number of interacting particles (which also corresponds roughly to powers of the density), converges very rapidly. The energy of nuclear matter is reduced substantially by our theory. When the theory is combined with Wong's idea of a 'soft' repulsive core, the binding energy becomes roughly 13 MeV per particle, in much better agreement with observation than other recent estimates. (Author)

AD-621 101 Div. 20/1
CORNELL UNIV ITHACA N Y
EXTRAPOLATION OF NUCLEON ELECTROMAGNETIC FORM FACTORS,
by J. S. Levinger, and C. P. Wang. 21 Dec 64, 12p.
Unclassified report

Pub. in The Physical Review v138 n5B pB1207-18 Jun 7 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nucleons, Electromagnetic properties), (*Electromagnetic properties, Mathematical prediction), Conformal mapping, Nuclear resonance, Elastic scattering, Deuteron reactions, Electrons

Conformal transformations are used to facilitate extrapolation of experimental values of the two isovector and two isoscalar nucleon form factors, to find their spectral functions. Both isovector spectral functions peak around 600 MeV, or somewhat below the energy of the isovector rho resonance. Both isoscalar spectral functions peak around 700 MeV, somewhat below the omega resonance. The electric form factor is analyzed for elastic electron-deuteron scattering in terms of the difference between the measured value and the calculated value. The latter uses assumptions concerning the deuteron wave function, and concerning the isoscalar electric nucleon form factor G. By extrapolating this difference, G is found in the time-like region anomalous threshold <t< the normal isocalar threshold. These values of G are statistically consistent with the measurements for space-like momentum transfer. Extrapolation of the combined set of values for G (space-like and time-like momentum transfers) gives a spectral function again peaking at 700 MeV, with indications of a dip at 1150 MeV. The dip may be due to the isocalar phi resonance. (Author)

AD-621 112 Div. 20/1
CORNELL UNIV ITHACA N Y
EXTRAPOLATION OF PROTON ELECTROMAGNETIC FORM FACTOR. II,
by J. S. Levinger, and C. P. Wang. 30 Jun 64, 9p.
Unclassified report
Pub. in Physical Review v136 n3B pB73

Pub. in Physical Review v136 n3B pB733-48 Nov 9 1964 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Protons, Electromagnetic properties), (*Electromagnetic properties, Mathematical prediction), Conformal mapping, Annihilation reactions, Proton scattering, Electrons

The proton form factors are extrapolated to time-like momentum transfers to determine the spectral functions. The extrapolations are compared with preliminary measurements of the cross section for proton-anti-proton annihilation into an electron-positron pair, for a time-like momentum transfer of 172 1/F-squared. This comparison determines an otherwise arbitrary parameter used in conformal-transformation procedure of extrapolation. The constraint is applied that electric and magnetic form factors are equal at time-like momentum transfer of 4M squared. Spectral functions are found with a peak around 625 MeV, a zero around 1050 MeV, and a minimum around 1500 MeV. (Author)

AD-621 113 See Fld. 20/3

AD-621 119 Div. 20/1 ,20/5
CFSTI Prices: HC $4.00 MF $1.00
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
THE THERMAL NEUTRON SPECTRUM IN A FINITEMASS MEDIUM.
Master's thesis,
by Ernest Park Sims. Aug 65, 132p. Rept. no. GNE/PHYS-65-18
Unclassified report

Descriptors: (*Thermal neutrons, Neutron spectrum), (*Neutron spectrum, Thermal neutrons), Gases, Neutron transport theory, Neutron flux, Neutron age, Energy, Gases, Programming (Computers)

The distribution of neutrons at thermal energies in a monatomic Maxwellian gas is determined. Spectra are found in various mass media and for varying amounts of absorption by numerically solving Corngold's higher-order gas equation; a result that is new. From the spectra obtained the average neutron velocity is found and the thermal diffusion length squared is calculated. Using this method and a neutron age from a moments method calculation, the migration area in selected real nuclides is determined. The deviations from Maxwellian of the thermal neutron spectra are used to determine the energy at which a neutron becomes thermal. This effective thermal transition energy, E*, is found for media of various mass with varying amounts of absorption. The neutron thermal spectrum is found to be generally non-Maxwellian for values of the absorption parameter greater than 0.01.

AD-621 121 See Fld. 18/9

AD-621 156 Div. 20/2 ,25/5
CFSTI Prices: HC $1.00 MF $0.50
STEVENS INST OF TECH HOBOKEN N J DEPT OF PHYSICS
PHYSICS: RELATIVISTIC COULOMB SCATTERING, RELATIVISTIC ELECTRON MONOPOLE SCATTERING, AND QUANTUM ELECTRODYNAMICS.
Status rept. no. 18, 1 Jan-30 Jun 65,
by Bernard Rosen. 30 Jun 65, 3p. Rept. no. SIT-P167
Contract Nonr26330 Proj. NR013 105
Unclassified report

Descriptors: (*Nuclear scattering, Electrons), (*Relativity theory, Nuclear scattering), Field theory, Quantum mechanics

Progress is reported on investigations of relativistic Coulomb scattering by the eikonal method and of the classical limit of quantum electrodynamics. Investigation of the relativistic scattering of electrons by a magnetic monopole, using the eikonal approximation, is reported.

AD-621 157 See Fld. 20/3

AD-621 158 Div. 25/7 ,4/4
CFSTI Prices: HC $1.00 MF $0.50
PITTSBURGH UNIV PA DEPT OF PHYSICS
ELECTRONIC AND IONIC COLLISION PROCESSES.
Status rept. no. 18, 1 Jun-31 Aug 65,
by Manfred A. Biondi. 31 Aug 65, 3p. Contract Nonr62400 Task 13
Unclassified report

Descriptors: (*Electron capture, Ions), (*Recombination reactions, Dissociation), Neon, Argon, Night sky, Cesium

To demonstrate that dissociative recombination is the mechanism responsible for electron capture in gases other than neon, spectral line shapes of recombination radiation from argon afterglows are investigated.

AD-621 193 See Fld. 3/1

AD-621 195 See Fld. 3/1

AD-621 196 See Fld. 3/1

AD-621 197 See Fld. 3/1

AD-621 198 See Fld. 3/1

AD-621 241 See Fld. 3/1

AD-621 244 See Fld. 7/4

AD-621 295 Div. 20/2
CORNELL UNIV ITHACA N Y
PHOTOPRODUCTION OF THE RHO (0) MESON.
Revised ed.,
by A. D. Franklin, D. R. Rust, A. Silverman, C. K. Sinclair, and R. M. Talman. 14 Sep 64, 5p.
Unclassified report

Pub. in Physical Review Letters v13 n15 p491-5 12 Oct 1964 (Copies not available to DDC or

Clearinghouse customers). Revision of manuscript received 6 Aug 64.

Descriptors: (*Photonuclear reactions, Mesons), (*Mesons, Photonuclear reactions), Pions, Gammaproton reactions

The results are reported of an investigation of the reaction: gamma + p to pion (+) + pion (-) + p, whose primary purpose was to investigate neutral rho-meson photoproduction.

AD-621 296 Div. 20/1 ,25/3
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
SU (6) AND THE ELECTROMAGNETIC FORM FACTORS,
by K. J. Barnes, P. Carruthers, and Frank von Hippel. 3 Dec 64, 3p.
Unclassified report

Pub. in Physical Review Letters v14 n3 p82-4 18 Jan 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nuclear properties, Electromagnetic properties), Charged particles, Invariance, Operators (Mathematics), Elementary particles

A nonstatic problem is discussed in which the possibility of an SU (6) symmetry arises in a natural way. It is shown that if an SU (6) invariance actually holds, then the magnetic moment ratio generalizes to the form-factor ratio = -2/3.

AD-621 299 See Fld. 18/4

AD-621 300 Div. 20/2
HARVARD UNIV CAMBRIDGE MASS CYCLOTRON LAB
THE ENERGY AND MOMENTUM DEPENDENCE OF NP CHARGE EXCHANGE SCATTERING,
by Richard Wilson. 1 Oct 64, 8p.
Unclassified report

Pub. in Annals of Physics v32 n2 p193-200 Apr 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Neutron scattering, Proton scattering), (*Proton scattering, Neutron scattering), Energy, Momentum, Meson reactions, Pions, Nuclear spins

The np charge exchange and ordinary scattering are presented as a function of the square of the invariant 4 momentum transfer. It is noted that from 91 MeV to 2840 MeV the variation with the incident energy and the variation with the 4 momentum transfer are independent. The significance of this is discussed. (Author)

AD-621 301 Div. 20/2
HARVARD UNIV CAMBRIDGE MASS CYCLOTRON LAB
A MEASUREMENT OF PROTON-PROTON BREMSSTRAHLUNG AT 160 MEV,
by B. Gottschalk, W. J. Shlaer, and K. H. Wang. 4 May 65, 2p.
Unclassified report

Pub. in Physics Letters v16 n3 p294-5 Jun 1 1965 (Copies available only to DDC users).

Descriptors: (*Bremsstrahlung, Proton scattering), (*Proton scattering, Bremsstrahlung), Inelastic scattering, Nuclear energy levels

Results are presented of a preliminary investigation of proton-proton bremsstrahlung. This study is made to further knowledge of the p-p interaction of the energy shell.

AD-621 319 See Fld. 20/6

AD-621 334 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
REAL PART OF THE SCATTERING AMPLITUDE AND THE BEHAVIOR OF THE TOTAL CROSS SECTION AT HIGH ENERGIES,
by N. N. Khuri, and T. Kinoshita. 21 Sep 64, 10p.
Unclassified report

Prepared in cooperation with Columbia Univ., New York. Pub. in The Physical Review v137 n3B pB720-9 8 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Nuclear scattering, Field theory), Energy, Mesons, Inequalities, Quantum mechanics, Elementary particles

Certain theorems first pointed out by Meiman are used to include the information contained in analyticity in energy and crossing symmetry in the derivation of upper bounds for the forward scattering amplitude. Theorems are obtained relating the asymptotic behavior of the ratio of the real part to the imaginary part of the forward amplitude on the one hand, to that of the total cross section on the other. Except for the special case where Ref/Imf=pi/lnE as the incident laboratory energy E approaches infinity, it is found that the Froissart bound can be improved. It is found that the GreenbergLow bound which follows from axiomatic field theory can always be improved by a fractional power of E under the physical assumption that the amplitude does not become purely real as E approaches infinity. It is found that the asymptotic behavior Ref=cE is not allowed. This sheds light on the question of the 'elementary' nature of vector mesons. An inequality is given which, in principle, could lead to an experimental check of analyticity and crossing with data obtained only from a finite range of energy. (Author)

AD-621 341 See Fld. 3/1

AD-621 346 See Fld. 7/2

AD-621 348 Div. 25/7 ,25/3
SHEFFIELD UNIV (ENGLAND) DEPT OF PHYSICS
SOME ELECTRON SPIN RESONANCE OBSERVATIONS OF GADOLINIUM S STATE IONS IN METALS,
by A. M. Harris, J. Popplewell, and R. S. Tebble. 20 Oct 64, 13p. Contract AF EOAR62 54 Proj. 9763 Task 976303
AFOSR , 65-1381
Unclassified report

Pub. in Proceedings of the Physical Society v85 p513-22 1965 (Copies available only to DDC users).

Descriptors: (*Paramagnetic resonance, Gadolinium alloys), (*Electrons, Spin), Ions, Magnetic resonance, Palladium alloys, Yttrium, Lutecium, Crystal lattices

Measurements of the paramagnetic g factors are made, using electron spin resonance at 8 mm wavelength, in solid solutions of gadolinium in yttrium, palladium and lutetium at temperatures between 60 K and 400 K. The measurements show that the g factor for the trivalent gadolinium ion in the metallic lattice varies significantly from the free ion value and is concentration dependent. For alloys containing more than 30% Gd in the Gd-Y alloy system, 80% Gd in the Gd-Lu alloy system, and for all concentrations in the Gd-Pd alloy system, the g factors are less than the free ion value. Lower concentrations of Gd in the Gd-Y and Gd-Lu alloy systems have g factors greater than the free ion value of 1.99. A qualitative attempt is made to explain this variation, using a model proposed by Kondo in which two interactions are considered. (Author)

AD-621 349 Div. 20/2
INSTITUTE OF THEORETICAL PHYSICS STANFORD UNIV CALIF
ON THE RADIATIVE CORRECTIONS TO THE MUON POLARIZATION FROM PION DECAY,
by E. S. Ginsberg, and R. H. Pratt. 8 Jun 64, 7p. Contract AF AFOSR62 452 Proj. 9751 Task 975101
AFOSR , 65-1356
Unclassified report

Pub. in Il Nuovo Cimento (Ser10) v34 p1633-7 Dec 16 1964 (Copies available only to DDC users).

Descriptors: (*Meson reactions, Pions), (*Muons, Polarization), Corrections, Neutrinos, Radioactive decay, Electrons, K mesons

It is noted that the polarization of muons (or electrons) from pion (or kaon) decay, pion (K) to muon (e) + neutrino, is not complete when radiative corrections are taken into account. It is shown that the correction is very small. (Author)

AD-621 351 Div. 20/2
STANFORD UNIV CALIF DEPT OF PHYSICS
CONSEQUENCES OF A WEAK VECTOR BOSON IN RADIATIVE MUON DECAY,
by E. S. Ginsberg, and R. H. Pratt. 22 Jun 64, 7p. Contract AF AFOSR62 452 Proj. 9751 Task 975101
AFOSR , 65-1355
Unclassified report

Pub. in Il Nuovo Cimento v35 (Ser10) p114-9 1965 (Copies available only to DDC users).

Descriptors: (*Bosons, Meson reactions), (*Meson reactions, Gamma emission), Muons, Neutrinos, Radioactive decay, Electromagnetic properties

Consequences of a weak vector boson, W, are calculated for radiative muon decay muon to e + neutrino + antineutrino + gamma, including the effects of anomalous electromagnetic properties for the W-boson. All effects are small relative to the spectrum in the absence of a W-boson. This is consistent with present experiments. (Author)

AD-621 353 Div. 20/1
OSLO UNIV (NORWAY) INST OF PHYSICS
SEARCH FOR AN EXCITED STATE OF THE BE9 HYPERNUCLEUS,
by A. G. Frodesen, F. Lunde, and O. Skjeggestad. 20 Dec 64, 4p. Contract AF EOAR100 63 Proj. 9751 Task 975101
AFOSR , 65-1354
Unclassified report

Pub. in Physica Norvegica v1 n5 p277-801 1965 (Copies available only to DDC users).

Descriptors: (*Excitation, Nuclei), (*Beryllium, Nuclei), Meson capture, K mesons, Helium

Amoung 43 uniquely identified lambda He5 and 29 lambda He4,5 hypernuclei produced in association with stable prongs of range < 500 microns in K (-) capture stars in nuclear emulsions, a search has been made to detect possible lambda He5 originating from an excited state of lambda Be9 via the decay mode lambda Be9* to lambda He5 + He4. For each of the capture stars the effective mass of the lambda He and each of the stable prongs have been calculated on the assumption that the stable prongs are alpha-particles. The experimental effective mass distribution has been compared with background estimates from 'Monte Carlo' calculations. The data are consistent with no lambda He5 events coming from lambda Be9*. (Author)

AD-621 364 See Fld. 20/13

AD-621 385 Div. 20/2

CFSTI Prices: HC $3.00 MF $0.50
PITTSBURGH UNIV PA
FORMAL SCATTERING THEORY AND THE COULOMB PROBLEM.
Technical rept.,
by Levere Hostler. 1965, 55p. Contract Nonr62416 Proj. NR012 119

Unclassified report

Descriptors: (*Nuclear scattering, Electric fields), (*Field theory, Nuclear scattering), Excitation, Perturbation theory, Quantum mechanics, Operators (Mathematics), Fourier analysis

It is attempted to salvage the usual apparatus of formal scattering theory in the case when there is a Coulomb field present. For this purpose, the time dependent approach to formal scattering theory is here presented without the use of adiabatic switching. Asympototic limits are investigated with the help of the Riemann-Lebesgue lemma. For scattering by a regular potential, the usual golden rule and the Lippmann-Schwinger equation are obtained. The same formalism is applied to the case of the Coulomb potential, and is found to bypass the ambiguities and 'wrong' factors which were encountered by a number of authors, and which are due to the anomalous behaviour of the Coulomb T-matrix on the energy shell. Other mathematical pathologies still remain in the Coulomb case, but these now take the form of infinite phase factors, and are presumbably fairly innocuous. (Author)

AD-621 388 See Fld. 18/2

AD-621 391 See Fld. 3/1

AD-621 399 Div. 20/1
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
SU (6) IN A BARYON BOOTSTRAP MODEL,
by Richard H. Capps. 23 Nov 64, 3p. Contract AF EOAR62 87
AFOSR , 65-1350

Unclassified report

Pub. in Physical Review Letters v14 n1 p31-3 Jan 4 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Baryons, Nuclear resonance), (*Nuclear models, Baryons), Meson reactions, V particles

A simple baryon bootstrap model is constructed.

AD-621 414 Div. 20/2
GLASGOW UNIV (SCOTLAND) DEPT OF NATURAL PHILOSOPHY
LONGITUDINAL DISPERSIVE CORRECTIONS TO ELASTIC SCATTERING OF HIGH ENERGY ELECTRONS ON O16,
by G. R. Bishop, A. Bottino, G. Ciocchetti, and A. Molinari. 25 Nov 64, 2p.

Unclassified report

Pub. in Physics Letters v14 n2 p140-1 Jan 15 1965 (Copies available only to DDC users).

Descriptors: (*Elastic scattering, Electrons), (*Oxygen, Elastic scattering), Transport properties, Corrections, Nuclear models

Dispersive corrections to elastic and inelastic scattering are considered on the basis of appropriate nuclear models. The elastic case with longitudinal interaction is treated. The O16 nucleus is chosen as a realistic nuclear model and is described by the independent particle model with particle-hole residual interaction.

AD-621 456 Div. 20/2
FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y
SUM RULES FOR THE REAL PART OF THE FORWARDSCATTERING AMPLITUDE.
Revised ed.,
by N. N. Khuri, and T. Kinoshita. 7 Dec 64, 3p.

Unclassified report

In cooperation with The Rockefeller Inst., New York. Pub. in Physical Review Letters v14 n3 p84-6 Jan 18 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 4 Nov 64.

Descriptors: (*Nuclear scattering, Electromagnetic waves), Meson scattering, Pions, Quantum mechanics, Field theory, Integrals

Sum rules satisfied by the real part of a crossing-symmetric forward-scattering amplitude are presented. These sum rules involve integration of the real part up to finite energies only and hold for any energy.

AD-621 462 See Fld. 7/2

AD-621 473 Div. 20/1 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
NAVAL CIVIL ENGINEERING LAB PORT HUENEME CALIF
CALCULATION OF THE ENERGY-ANGULAR RELATIONSHIP FOR NEUTRONS FROM A NEUTRON GENERATOR.
Technical note,
by Charles M. Huddleston, and Nathan F. Shoemaker. 2 Sep 65, 13p. Rept. no. TN-N-763 Proj. Y F008 08 05 201

Unclassified report

Descriptors: (*Neutron transport theory, Energy), Neutron reactions, Deuteron bombardment, Tritium, Deuterium, Relativity theory, Reactor shielding calculations

A relativistic calculation is made to determine the energy of neutrons emitted from the NCEL neutron generator as a function of the angle of emission. Both the tritium reaction, T (d,n)He4, with a neutron energy of approximately 14 Mev, and the deuterium reaction, D (d,n)He3, with a neutron energy of approximately 2.5 Mev, are considered. Values of neutron energy as a function of angle are tabulated and plotted. (Author)

AD-621 496 See Fld. 21/2

AD-621 513 Div. 20/2 ,20/5
CFSTI Prices: HC $1.00 MF $0.50
MINNESOTA UNIV MINNEAPOLIS
NUCLEAR PHYSICS: PARTICLE INTERACTIONS AT ENERGIES UP TO 4 MEV USING THE MINNESOTA VAN DE GRAAFF GENERATOR: AND MASS SPECTROMETRY,
by J. Morris Blair, and Alfred O. C. Nier. 17 Sep 65, 12p. Contract Nonr71018

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Van de Graaff generators, Particle accelerators), (*Mass spectroscopy, Nuclear physics), (*Nuclear reactions, Van de Graaff generators), Nuclear reactions, Nuclear properties, Isotope availability, Proton bombardment, Deuteron bombardment, Ion bombardment

A summary is given of work on the Van de Graaff generator program, the development of mass spectrometers, the precision mass determination, and isotope abundance measurements. Thesis research and publications under this contract are listed.

AD-621 558 Div. 20/2
CFSTI Prices: HC $1.00 MF $0.50
INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY (MEXICO)
CHANGE OF THE MOMENTUM AND ENERGY OF ELECTRONS FROM SYSTEMS WITH VARIABLE PHYSICAL STATES.
Technical rept.,
by Felix Castillo Jiminez. 1964, 6p. Contract DA ARO49 092 64G43 Proj. 20010501B700

Unclassified report

Descriptors: (*Electrons, Momentum), (*Annihilation radiation, Electrons), Phase studies, Solids, Liquids, Energy, Gamma emission, Waxes

The difference between the momentum distributions of electrons in the liquid and solid states has been investigated. The technique used is to measure the angular correlation of the gamma rays which are emitted when positrons are annihilated by the electrons of the substance-under study. A significant difference in the momentum distribution of electrons in the two phases has been observed. The substances used in the investigation were paraffin, candelilla wax, campeche wax and synthetic wax. (Author)

AD-621 589 See Fld. 7/4

AD-621 590 Div. 20/1
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
STOPPING POWERS AND STRAGGLING IN NEON, ARGON AND KRYPTON,
by R. J. Bell, and A. Dalgarno. 10 Mar 65, 4p. Contract N62558 4297

Unclassified report

Prepared in cooperation with Mathematics Div., National Physical Lab., Teddington (England). Pub. in Proceedings of the Physical Society v86 p375-7 1965 (Copies available only to DDC users).

Descriptors: (*Excitation, Energy), (*Helium group gases, Atomic properties), Neon, Argon, Krypton

A semi-empirical procedure is used to calculate the mean excitation energies appropriate to stopping powers I and to straggling K in neon, argon and krypton. The results are Ne: I = 150 ev; K = 1200 ev; Ar: I = 220 ev, K = 3200 ev; KR: I = 360 ev, K = 9600 ev. They are consistent with the experimental data. (Author)

AD-621 593 Div. 20/2
CALIFORNIA INST OF TECH PASADENA
P-P AND P-N FINAL-STATE INTERACTIONS IN SEVERAL THREE-BODY REACTIONS,
by T. A. Tombrello, and A. D. Bacher. 18 May 65, 4p. Contract Nonr22047

Unclassified report

Pub. in Physics Letters v17 n1 p37-9 Jun 15 1965 (Copies available only to DDC users).

Descriptors: (*Proton scattering, Neutron scattering), (*Neutron scattering, Proton scattering), Nuclear reactions, Helium, Deuteron capture, Alpha decay, Proton bombardment, Tritons, Nuclear spins

Three reactions are investigated that show a strong final-state interaction between the two protons: 3He (d,t)2p, 3He (3He,alpha)2p, and 3He (p,d)2p. The reaction 3He (d,3He) pn is investigated because of the singlet p-n interaction. For comparison the 4He (d,alpha)pn reaction is investigated, in which isospin conservation should strongly inhibit the s-wave, singlet p-n final-state interaction.

AD-621 598 See Fld. 20/12

AD-621 602 See Fld. 20/3

AD-621 612 Div. 25/7 ,15/1

QUEEN'S UNIV BELFAST (NORTHERN IRELAND)

AN EXPANSION METHOD FOR CALCULATING ATOMIC PROPERTIES. V. TRANSITION PROBABILITIES OF M SHELL ELECTRONS,

by R. J. S. Crossley, and A. Dalgarno. 17 Dec 64, 10p. Contract N62558 3634

Unclassified report

Pub. in Proceedings of the Royal Society, A v286 p510-8 1965 (Copies available only to DDC users). Complete text available from CFSTI HC$2.00, MF$0.50 as AD-612 924.

Descriptors: (*Electron transitions, Probability), (*Probability, Electron transitions), Integrals, Power series, Atomic energy levels, Atomic properties, Sodium, Magnesium, Atomic spectroscopy, Astrophysics, Eire

The expansion method is extended to M-shell electrons and explicit calculations are carried out of the probabilities of all dipole transitions between configurations 1s32s23e - 1s22s23e and between configurations 1s22s23e1 3 e2 - 1s22s23e1 3e2, taking into account the mixing of degenerate configurations. Results are presented for all members of the sodium and magnesium isoelectronic sequences. (Author)

AD-621 619 Div. 20/2

YALE UNIV NEW HAVEN CONN

PHASE-SHIFT ANALYSIS OF ELASTIC PION-NUCLEON SCATTERING,

by M. H. Hull,Jr., and F. C. Lin. 29 Mar 65, 16p. Contract DA ARO D31 124G607 Proj. 893P Task 18AROD
893:103

Unclassified report

Pub. in Physical Review v139 n3B pB630-45 Aug 9 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Elastic scattering, Nucleons), (*Nuclear scattering, Pions), (*Phase shift, Nuclear scattering), Meson scattering, Quantum mechanics

A many-energy analysis of pion-nucleon scattering data in the energy range 20-340 MeV was carried out by fitting phase shifts in S, P, D, and F states in gradient searches. Semiphenomenological analyses, with F-wave phase shifts calculated from approximate evaluations of pion-nucleon dispersion relations and D-wave phase shifts similarly obtained for the lower energy range, have been equally successful in fitting the data. Particular attention was paid to the possibility of obtaining a unique set from all possible sets allowed by data. Several sets of phase shifts were round. One of these, called SEMI IIM, is preferred by data and by comparison with dispersiontheoretical calculations. Comparisons with other recent analyses are made. (Author)

20/10. QUANTUM THEORY

AD-620 865 See Fld. 20/3

AD-620 891 Div. 25/5

CFSTI Prices: HC $2.00 MF $0.50

ALLIED RESEARCH ASSOCIATES INC CONCORD MASS

VISCOELASTIC STRESS CONCENTRATION FACTORS.

Final rept.,
by Ralph Papirno, and Herbert Becker. Apr 65, 30p. Rept. no. ARA-F-226-3
Contract Nonr405800

Unclassified report

Descriptors: (*Rods, Stresses), (*Viscoelasticity, Rods), Loading (Mechanics), Deformation, Creep, Model tests, Synthetic rubber, Elasticity, Experimental data, Structures, Mathematical analysis

Through the use of a new photoviscoelastic material, stereospecific polybutadiene, an exploratory photomechanical investigation was made of viscoelastic stress concentration factors in bars loaded in dead weight tension. Despite large creep deformations of the originally circular holes and circular arc fillets in the bars, the stress concentration factors were observed to change by only about 25 percent of the initial values, which were in fair agreement with existing data on elastic concentrations. (Author)

AD-621 090 See Fld. 20/8

AD-621 116 Div. 25/5 ,15/1

LINCOLN LAB MASS INST OF TECH LEXINGTON

TRANSFORMATION FROM A LINEAR MOMENTUM TO AN ANGULAR MOMENTUM BASIS FOR PARTICLES OF ZERO MASS AND FINITE SPIN,

by Harry E. Moses. 16 Nov 64, 14p. Rept. no. JA-2461
Contract AF19 628 5167 Proj. arpa order 600

ESD , TDR-65-429

Unclassified report

Pub. in Journal of Mathematical Physics v6 n6 p928-40 Jun 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Momentum, Operators (Mathematics)), (*Relativity theory, Operators (Mathematics)), Matrix algebra, Groups (Mathematics), Spin, Dynamics, Transformations (Mathematics)

The infinitesimal generators of the inhomogeneous Lorentz group have been given in a basis in which the compenents of the linear momentum operators are diagonal and in another basis in which the square of the angular momentum is diagonal for all unitary irreducible ray representations of the group. In the present paper it is shown, how the two bases are related for representations corresponding to zero mass and any (finite) spin. It will be shown how this relation enables one to integrate the infinitesimal generators in the angular momentum basis and thereby permits one to show how the angular momentum of a particle changes under the inhomogeneous Lorentz group. In particular, we study the way that the angular momentum of a massless particle of any spin appears in translated and moving frames of reference. (Author)

AD-621 156 See Fld. 20/8

AD-621 208 See Fld. 20/6

AD-621 234 Div. 25/5

LINCOLN LAB MASS INST OF TECH LEXINGTON

THE KINEMATICS OF THE ANGULAR MOMENTUM OF A PARTICLE. I. TRANSLATION BROADENING OF ANGULAR MOMENTUM,

by Harry E. Moses, and Shou-Chin Wang. 24 Aug 64, 18p. Rept. no. JA-2320B
Contract AF19 628 5167 Proj. arpa order 600

ESD , TDR-65-427

Unclassified report

Pub. in Nuovo Cimento v36 (ser10) p788-804 Apr 1 1965 (Copies available only to DDC users).

Descriptors: (*Momentum, Quantum mechanics), (*Particle trajectories, Relativity theory), (*Transformations (Mathematics), Relativity theory), Mechanics, Hamiltonian, Kinetic theory, Gases, Selection rules

The way a particle changes its angular momentum under inhomogeneous Lorentz transformations is wellknown classically. The problem is considered quantummechanically for particles of any mass and any spin. The case is considered where a particle has a definite angular momentum in one frame of reference and the probability distribution of angular momentum in a frame translated with respect to the original frame is calculated. The basic mathematical tool is the form for the infinitesimal generators of the inhomogeneous Lorentz group devised by Lomont and Moses in which the Hamiltonian, square of the angular momentum, z-component of angular momentum, and helicity are diagonal. The present paper and the projected one are important in multiple scattering problems, for it is possible using the results to take into account, to a certain degree at least, the effect of the selection rules. These rules are almost always ignored in multiple scattering problems. For example, it is shown that when the density of a gas is sufficiently low, radiative cooling goes on at a much faster rate when selection rules are taken into account than when they are ignored. (Author)

AD-621 391 See Fld. 3/1

AD-621 416 Div. 25/5 ,25/4

FLOYD NEWMAN LAB OF NUCLEAR STUDIES CORNELL UNIV ITHACA N Y

COHERENT STATES AND THE NUMBER-PHASE UNCERTAINTY RELATION,

by P. Carruthers, and M. M. Nieto. 25 Jan 65, 3p.

Unclassified report

Pub. in Physical Review Letters v14 n11 p387-9 Mar 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electromagnetic waves, Field theory), (*Harmonic oscillators, Excitation), Quantum mechanics, Probability, Operators (Mathematics)

A number-phase uncertainty relation connecting the excitation number of an oscillator to the phase angle is formulated in terms of S and C operators. The new expression for the so-called coherent states is evaluated.

AD-621 624 See Fld. 3/1

20/12. SOLID STATE PHYSICS

AD-620 842 See Fld. 20/1

AD-620 848 See Fld. 7/4

AD-620 866 See Fld. 22

AD-620 886 Div. 25/6

CFSTI Prices: HC $4.00 MF $1.00

EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZURICH (SWITZERLAND)

BOLTZMANN EQUATION APPROACH TO PHOTOCONDUCTIVITY IN SEMICONDUCTORS WITH OPTICAL PHONONS.

Doctoral thesis,
by Hans Juerg Stocker. Jun 65, 143p. Contract AF33 657 10186 Grant ,AF AFOSR420 63

Unclassified report

Descriptors: (*Kinetic theory, Semiconductors), (*Photoconductivity, Semiconductors), (*Phonons, Photoconductivity), Nonlinear differential equations, Integral equations, Transport properties, Photons, Elastic scattering, Indium compounds, Antimony compounds, Switzerland

The Boltzmann equation for the distribution function of conduction electrons in an electric field, including: generation of electrons due to photon absorption, recombination, elastic scattering, and optical phonon emission, is constructed and solved with the aid of some simple assumptions about the energy dependences of the various transition rates. The photoconductive current, as a function of photon energy, shows oscillations with minima at multiples of the optical phonon energy, in agreement with recent observations in the low temperature photoconductivity of several semiconductors. The

oscillations are the result of the strong interaction of electrons with longitudinal optical phonons. An energy variation of either lifetime or elastic scattering is not necessary for the existence of these oscillations, although their exact shape depends on it. The calculated field dependence of the shape of the oscillatory photoconductivity agrees qualitatively with experiments in InSb. (Author)

AD-620 888 Div. 25/6
CFSTI Prices: HC $2.00 MF $0.50
BROWN UNIV PROVIDENCE R I DIV OF APPLIED MATHEMATICS
AN INTERPOLATION CURVE USING A SPLINE IN TENSION.
Technical rept.,
by Daniel G. Schweikert. Apr 65, 33p. Contract Nonr56236 Proj. NR044 309
Unclassified report

Descriptors: (*Numerical analysis, Beams (Structural)), (*Beams (Structural), Numerical analysis), Elasticity, Tensile properties, Matrix algebra

The use of a linearized mathematical spline for interpolation between given points occasionally yields extraneous inflection points which for some applications, notably the fairing of ship lines, are not acceptable. To avoid this difficulty, a spline in tension is considered and the value of tension which is sufficient to remove all the extraneous inflection points is determined. The slopes of the interpolating curve at each of the given stations are considered as the unknowns and can be calculated without the necessity of numerical matrix inversion. (Author)

AD-620 889 Div. 25/6 ,25/2
CFSTI Prices: HC $1.00 MF $0.50
PENNSYLVANIA UNIV PHILADELPHIA
Z2 CENTERS IN KCL SINGLE CRYSTALS.
Status rept.,
by K. R. Atkins, and Max E. Caspari. 1 Aug 65, 2p. Contract Nonr55128
Unclassified report

Descriptors: (*Single crystals, Color centers), (*Color centers, Physical properties), Potassium compounds, Chlorides, Optical properties, Electrical properties

A brief summary is given of researches on the electrical and optical of Z2 centers in irradiated potassium chloride single crystals.

AD-620 890 Div. 25/6 ,8/2 ,25/2
CFSTI Prices: HC $2.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
THICKNESS-SHEAR AND FLEXURAL VIBRATIONS OF PARTIALLY PLATED, CRYSTAL PLATES.
Technical rept. and Interim technical rept.,
by R. D. Mindlin, and P. C. Y. Lee. Jun 65, 31p. Rept. no. TR-3 ,ITR-2
Contract Nonr425913 ,DA36 039AMC00065E Proj. NR064 388
Unclassified report

Descriptors: (*Quartz, Vibration), (*Crystals, Electronic equipment), (*Plating, Crystals), Partial differential equations, Deformation, Thickness, Wave transmission, Propagation, Resonance

In this paper, mathematical solutions are exhibited which predict the influence of length and mass, of rectangular electrode platings, on the Q of the fundamental thicknessshear resonance and on the number and distribution of anharmonic overtones between the cut-off frequencies of the plated and unplated portions of AT-type quartz plates. (Author)

AD-620 892 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF PHYSICS
THEORETICAL SOLID STATE PHYSICS.
Semi-annual progress rept. for 1 Oct 64-30 Sep 65,
by J. M. Luttinger. 30 Sep 65, 4p. Contract Nonr26680
Unclassified report

Descriptors: (*Solid state physics, Theory), Crystal lattice defects, Transport properties, Electrons, Electrical impedance, Surface properties, Superconductors

Work for the period Oct 64 to Sept 65 is briefly summarized. Topics included are: Transport properties of noninteracting electrons scattered by fixed impurities; Surface impedance of a metal or semi-metal when the fermisurface is ellipsoidal and the electron reflection at the surface is specular; Effects of the handau function on properties of electrons in metals; Thermal transport in superconductors.

AD-620 897 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
STRESS FUNCTIONS FOR A COSSERAT CONTINUUM.
Technical rept.,
by R. D. Mindlin. Sep 64, 16p. Rept. no. TR-53
Contract Nonr26609 Proj. NR064 388
Unclassified report

Descriptors: (*Stresses, Continuum mechanics), (*Continuum mechanics, Stresses), Potential theory, Elasticity, Microstructure, Vector analysis, Functions

In this paper, a complete solution, in terms of stress functions of classical elasticity, is obtained for the linear equations of an isotropic, elastic, Cosserat continuum. The special solutions for the concentrated force and couple are also given. (Author)

AD-620 898 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
ON THE EQUATIONS OF ELASTIC MATERIALS WITH MICROSTRUCTURE.
Technical rept.,
by R. D. Mindlin. Jun 64, 13p. Rept. no. TR-51
Contract Nonr26609 Proj. NR064 388
Unclassified report

Descriptors: (*Elasticity, Equations), (*Microstructure, Elasticity), Partial differential equations, Vector analysis, Materials, Deformation

The discussion is centered around Helmholtz resolutions for equations of an isotropic, elastic material with microstructure.

AD-620 902 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
CARNEGIE INST OF TECH PITTSBURGH PA
INVESTIGATIONS IN SOLID STATE PHYSICS.
Final rept. for 1 Apr 55-31 Jan 65,
by S. A. Friedberg. 9 Jul 65, 14p. Contract Nonr76005 Proj. NR018 301
Unclassified report

Descriptors: (*Solid state physics, Scientific research), Crystal lattices, Heat transfer, Transport properties, Paramagnetic materials, Ions, Transition elements, Alloys

Principal results obtained during the period from April 1955 to January 1965 are summarized. Publications are listed in which these results are fully described. Some topics discussed are: Substances with the diamond lattice; Magnon contributions to heat transport; Systems of coupled paramagnetic ions; Transition metals and their alloys; Miscellaneous compounds.

AD-620 906 Div. 25/6
CFSTI Prices: HC $4.00 MF $1.00
ILLINOIS UNIV URBANA
FREE AND FORCED VIBRATIONS OF SPHERICAL SHELLS.
Structural research series on Civil Engineering Studies,
by M. S. Zarghamee, and A. R. Robinson. Jul 65, 139p. Rept. no. SRS-293
Contract Nonr183403 Proj. NR064 183
Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Structural shells, Vibration), (*Spheres, Vibration), Numerical analysis, Frequency, Integration, Blast, Loading (Mechanics)

The purpose of the investigation is to study the free vibrations of a spherical shell segment with rigidly clamped boundary, and to compute the response of such a shell segment to realistic loading resulting from a blast wave. The study is limited to cases for which the material stays linearly elastic, and strains and rotations remain small. Two methods of analysis are developed for the free vibrations of the spherical shell segments.

AD-620 915 **See Fld. 9/2**

AD-620 920 **See Fld. 9/1**

AD-620 938 Div. 25/6 ,4/3
CFSTI Prices: HC $3.00 MF $0.75
NEW YORK UNIV N Y SCHOOL OF ENGINEERING AND SCIENCE
APPLICATION OF ULTRA HIGH PRESSURE TO A STUDY OF ORGANIC SEMICONDUCTORS.
Final rept. for 1 Mar 63-28 Feb 65,
by Y. Okamoto. Jun 65, 78p. Contract AF19 628 2482 Proj. 8659 Task 865901 AFCRL , 65-294
Unclassified report

Descriptors: (*Semiconductors, High-pressure research), (*Organic compounds, Semiconductors), Metalorganic compounds, Ferrocenes, Nickel compounds, Cobalt compounds, Electrical conductance, Electrical properties, Compressive properties, Chemical bonds, Infrared spectroscopy, Quinones

The electrical conductivity measurement apparatuses for organic compounds under the pressure range of 1 to 40,000 atmospheres and at various temperatures (25 - 400C) were developed. The effects of pressure and temperature on the electrical conductivity of organic compounds such as ferrocene, nickelocene, tetrathioteracene-o-chloranil, cobaltocene 3,3', 5,5'tetrabromo p-diphenoquinone and durene diaminechloranil complexes were investigated. The effect of pressure on the electrical properties of the organic solids is discussed. Some theoretical considerations on the effects of the structure of organic compounds were made. The infrared spectrum measurement of organic compounds under pressure was also studied. The results indicated the molecule became closed together and bonding charge transfer complexes tended to form dative bonding. Compressibility and single crystal growth of organic compounds with heating under pressure were attempted. (Author)

AD-620 982 Div. 25/6 ,15/2
PENNSYLVANIA UNIV PHILADELPHIA
STATISTICAL PROPERTIES OF THE STRESS AND STRAIN FIELDS IN A MEDIUM WITH SMALL RANDOM VARIATIONS IN ELASTIC COEFFICIENTS,

by J. Molyneux, and M. Beran. 1965, 16p. Contract DA ARO D31 124G331
AROD , 3734:6

Unclassified report

Pub. in Journal of Mathematics and Mechanics v14 n3 p337-52 May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Mechanical properties, Statistical analysis), (*Statistical analysis, Mechanical properties), Elasticity, Tensor analysis, Perturbation theory, Hydrostatic pressure, Correlation techniques

AD-620 993 **See Fld. 13/13**

AD-620 995 Div. 25/6 ,25/3 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
A METHOD OF DETECTING SUPERCONDUCTING INTERMETALLIC COMPOUNDS,
by I. B. Borovskii. 3 Jun 65, 5p. Rept. no. FTD-TT-65-184
TT , 65-63920

Unclassified report

Unedited rough draft trans. of Patent (USSR) 157 557, appl. no. 763699, 5 Nov 62.

Descriptors: (*Intermetallic compounds, Superconductivity), (*Superconductors, Intermetallic compounds), Metals, Alloys, Magnetic fields, Heat treatment, Patents, USSR

The object of the invention is a method of detecting superconducting intermetallic compounds in specimens of different metals and their compounds which is based on the determination of a change in the magnetic field and which is distinguished by the fact that, for the purpose of more rapidly determining the composition of a superconducting compound, the investigated specimen, consisting of two metals or alloys, first is subjected to a brief diffusion roasting (annealing), and then there acts on it a uniform magnetic field, and by the change in the magnetic force lines using known methods one determines the properties of the composition of the superconducting compound. (Author)

AD-621 005 Div. 25/6 ,25/1
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
UKRAINIAN JOURNAL OF PHYSICS (SELECTED ARTICLES),
15 Jun 65, 31p. Rept. no. FTD-TT-65-233
TT , 65-63930

Unclassified report

Unedited rough draft trans. of Ukrayins'ki Fizychnyi Zhurnal (USSR) v9 n7 p733-43, 766-8 1964. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Recombination reactions, Nickel alloys), (*Ultrasonic properties, Metals), Germanium alloys, Diodes (Semiconductor), Sound transmission, Velocity, Melting, Interferometers, Reports, USSR

CONTENTS: Investigating recombinations on nickel atoms in p-Germanium at high injection levels; High temperature ultrasonic interferometer.

AD-621 036 Div. 25/6 ,25/2 ,25/4 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH
OPTICAL AND ELECTRICAL PROPERTIES OF CRYSTALS.
Annual summary rept. no. 1,
by Robert Englman. 31 May 65, 6p. Contract AF61 052 806
AFCRL , 65-657

Unclassified report

Descriptors: (*Paramagnetic materials, Optical properties), (*Crystals, Electrical properties), Absorption spectrum, Crystal structure, Crystal lattices, Vibration; Crystal lattice defects, Electromagnetic fields, Selection rules, Israel

The following aspects of the absorption due to paramagnetic ions were investigated: the calculation of the intensity in tetrahendral surroundings, the vibronic interaction near accidental degeneracies, the fluctuations of the trigonal field strength (reported in AD-619 881) and the absorption probability in spin-forbidden transitions. (Author)

AD-621 037 Div. 25/6 ,25/8
CFSTI Prices: HC $1.00 MF $0.50
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH
ON THE MEASURED FREQUENCY FACTORS IN THERMOLUMINESCENCE.
Scientific rept.,
by R. Chen, and A. Halperin. May 65, 12p.
Rept. no. SR-3
Contract AF61 052 759
AFCRL , 65-627

Unclassified report

Prepared in cooperation with The Hebrew Univ., Jerusalem (Israel). Dept. of Physics.

Descriptors: (*Luminescence, Thermal properties), (*Crystal lattices, Vibration), Frequency, Excitation, Color centers, Kinetic theory, Tunneling (Electronics), Electrical conductance, Israel

The differences, by many orders of magnitude, between the escape-frequency factors obtained in thermoluminescence measurements and the frequency of the lattice vibrations are discussed. It is shown that various processes can be formulated by kinetic equations mathematically identical with those given by Randall and Wilkins but with other pre-exponential factors replacing the frequency factor. Two such processes are proposed: one in which the concentration of conduction electrons increases exponentially with temperature, and one in which the transitions between trapping levels and luminescence centers occur within localized centers. (Author)

AD-621 038 Div. 25/6 ,25/2 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH
ON THE ANALYSIS OF THERMALLY STIMULATED PROCESSES IN CRYSTALS.
Scientific rept.,
by R. Chen, and A. Halperin. Jun 65, 24p. Rept. no. SR-4
Contract AF61 052 759
AFCRL , 65-628

Unclassified report

Prepared in cooperation with Hebrew Univ., Jerusalem.

Descriptors: (*Crystals, Thermal properties), (*Semiconductors, Thermal properties), (*Luminescence, Semiconductors), (*Thermoelectricity, Semiconductors), Electrons, Recombination reactions, Probability, Heating, Excitation, Israel

The relation between thermoluminescence curves and thermally stimulated current curves is discussed assuming that electrons are stimulated from traps to recombination centers through the conduction band. A method for calculating the recombination probability by simultaneous measurement of thermoluminescence and thermally stimulated current is given. Some special cases are discussed more thoroughly, especially the case of an extrinsic semiconductor (semiconducting diamond for example), heated according to a hyperbolic heating programme. A preliminary comparison of theory and experiment is made. (Author)

AD-621 049 Div. 25/6 ,20/3
CFSTI Prices: HC $2.00 MF $0.50
ECOLE NORMALE SUPERIEURE PARIS (FRANCE)
RADIATION DAMAGE IN SEMICONDUCTORS.
Annual summary rept. no. 4,
by P. Baruch. 20 Jul 65, 36p. Contract AF61 052 543
AFCRL , 65-588

Unclassified report

Descriptors: (*Semiconductors, Radiation damage), (*Radiation damage, Semiconductors), Silicon, Diffusion, Impurities, Proton bombardment, Electron beams, Nuclear particles, Crystal lattice defects, Annealing

The effect of radiation-induced point defects on impurity diffusion in silicon is investigated using proton and electron irradiation. The active defects have a diffusion length near 3 microns in pulled silicon, and dislocations are found to act as defect sinks, but are not dominant for dislocations densities less than 10 to the 7th power/sq cm. Defect precipitation is shown to occur at high defect concentrations, leading to enhanced annealing of point defects and formation of stress centers stable against annealing to 1000C. A model is proposed by which impurities diffuse by a vacancy mechanism and vacancy diffusion is limited by complex formation with oxygen atoms. (Author)

AD-621 050 Div. 25/6 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THEORY OF PLASTIC FLOW AT NONISOTHERMAL LOADING,
by I. A. Birger. 10 Jun 65, 10p. Rept. no. FTD-TT-64-1266
TT , 65-63950

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika i Mashinostroenie, n1 p193-6 1964.

Descriptors: (*Plasticity, Theory), (*Creep, Theory), Loading (Mechanics), Temperature, Deformation, Stresses, Partial differential equations, Mathematical analysis

A generalization of the theory of plastic flow in case of nonisothermal loading is presented.

AD-621 056 Div. 25/6 ,17/7
CFSTI Prices: HC $2.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
NEWS OF THE ACADEMY OF SCIENCES OF THE USSR. PHYSICS SERIES. (SELECTED ARTICLES).
5 Jun 65, 36p. Rept. no. FTD-TT-65-218
TT , 65-63941

Unclassified report

Unedited rough draft trans. of Akademiya Nauk SSSR. Izvestiya. Seriya Fizicheskaya, v28 n6 p969-76, 977-9, 993-5, 1000-1, and 1065-8.

Descriptors: (*Semiconductors, Alloys), Semiconducting films, Antimony alloys, Indium alloys, Gallium alloys, Arsenic alloys, Zinc alloys, Selenium alloys, Mercury alloys, Intermetallic compounds, Electrical properties, Thermal properties, Thermal conductivity, Single crystal, Solid solutions, Crystal lattices, Magnetic properties

Contents: Electric and thermal properties of antimonide indium (indium antimonide) in a magnetic field, by G. Veyss; Investigating thermal conduction of alloyed gallium arsenide, by M. I. Aliyev and G. T. Akhmedli; Effect of layer structure on the magnitude of current carrier mobility in indium antimonide films, by V. A. Kasyan and M. V. Kot; Monocrystals of indium antimonide/gallium antimonide alloys and their electric properties, by I. S. Baukin, V. I. Ivanov-Omskiy and B. T. Kolomi-

yets; Structure and electrical properties of ZnSe-HgSe system, by M. V. Kot and A. V. Simashkevich.

AD-621 063 Div. 25/6 ,17/2 ,14/6
CFSTI Prices: HC $7.00 MF $1.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INVESTIGATIONS IN ELASTICITY AND PLASTICITY (COLLECTION OF ARTICLES): COLLECTION 3,
by L. M. Kachanov. 27 Aug 65, 337p. Rept. no. FTD-MT-64-533
TT , 65-63948
Unclassified report

Edited machine trans. of mono. Issledovniya po Uprugosti i Plastichnosti: Sbornik 3, Leningrad, 1964 p1-272. Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Mechanics, Reports), (*Elasticity, Reports), (*Plasticity, Reports), Mechanical properties, Structural shells, Theory, Fracture (Mechanics), Solids, Stresses, Strain (Mechanics), USSR, Mathematical analysis, Vibration, Thermal conductivity, Deformation, Optical properties, Plastics, Glass, Steel, Metals, Laminates, Composite materials

The articles consider certain questions of the theory of plasticity, two- and three-dimensional problems of the theory of elasticity, statics and oscillations of thin shells, fracture of solid bodies, an optical method of investigation of stresses, experimental investigations of stresses and strains in metals, bimetal articles and anisotropic laminated plastics. (Author)

AD-621 075 Div. 25/6 ,8/2
CFSTI Prices: HC $4.00 MF $0.75
SHOCKLEY LAB ITT SEMICONDUCTOR PALO ALTO CALIF
RELIABILITY PHYSICS STUDIES ON TRANSISTORS.
Quarterly status rept. no. 1, Dec 64-Feb 65,
by Walter Schroen. Aug 65, 101p. Contract AF30 602 3605 Proj. 5519 Task 551906
RADC , TR-65-141
Unclassified report

Descriptors: (*Transistors, Reliability (Electronics)), (*Semiconductors, Failure (Mechanics)), Silicon, Diodes (Semiconductors), Surface properties, Voltage, Electric discharges, Thermal properties, Photosensitivity, Plasma physics

The report deals with failure mechanisms in silicon semiconductors. Investigations were made of surface breakdown phenomena in oxide protected silicon devices. The surface breakdown voltage of a diode can be altered by external illumination or by carriers moving in surface channels. The fact that a small photocurrent controls an avalanche current which is several orders of magnitude larger has been studied in three respects: The effect of the illumination itself, both with and without an additional gate around the diode under consideration, the effect of an adjacent diode located at a certain distance from the diode under study, with and without gate, and the effect of surface ion drift, again with and without gate. Further investigations are made of the second breakdown phenomenon in silicon power transistors. Diode structures have been used to observe the appearance of hot spots. Plasma breakdown in relatively large areas has been observed. The high temperature associated with the plasma was able to seriously damage the aluminum evaporated for contacting the diodes.

AD-621 107 Div. 25/6
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MATHEMATICS
A NOTE ON STRESS FUNCTIONS AND COMPATIBILITY EQUATIONS IN SHELL THEORY,
by Eric Reissner. Jan 62, 11p.
Unclassified report

Pub. in Topics in Applied Mechanics (Netherlands) Memorial Vol p23-32 1965 (Copies available only to DDC users).

Descriptors: (*Structural shells, Theory), Stresses, Strain (Mechanics), Elastic shells, Vector analysis, Equations, Compatibility, Functions

The two vector equilibrium equations of linear shell theory are satisfied in terms of two vector stress functions. Reduction of the result to scalar form leads to expressions for six stress resultants and four stress couples in terms of four scalar stress functions. Utilization of this stress function representation in conjunction with a virtual work equation is shown to lead to four compatibility equations for strain. For the case of vanishing transverse shearing strains these four compatibility equations reduce to equations previously given by Goldenweiser. (Author)

AD-621 114 **See Fld. 20/6**

AD-621 117 Div. 25/6 ,30/5
CFSTI Prices: HC $3.00 MF $0.75
AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING
MATERIALS STRENGTH PROPERTIES UNDER DYNAMIC LOADING.
Master's thesis,
by Joseph Burton Webster,III.. May 65, 88p.
Rept. no. GNE/Phys/65-21
Unclassified report

Descriptors: (*Loading (Mechanics), Test methods), (*Materials, Loading (Mechanics)), Metals, Highpressure research, Shock waves, Aluminum alloys, Dynamics, Compressive properties, Stresses, Strain (Mechanics), Test equipment

An experimental technique for evaluating a material's response to dynamic loading has been developed, which is particularly applicable to metals exhibiting a two wave structure in the region from ten to twenty kilobars of compressive stress. The technique included the development of a thin flyer type projectile to produce finite duration pulses which could be controlled for each test. Although the technique was fairly simple to employ, it yielded an accurate means of studying the series of states along a shock's compressive and unloading fronts, as well as giving a peak state which might be used in a peak states dynamic relationship. One continuous record of stress as a function of time at a given distance through the sample material and the material's initial density are all the information necessary to obtain these relationships, as they were derived from interpretive analysis of the waveform. (Author)

AD-621 130 Div. 25/6 ,25/1 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
JOHN CARROLL UNIV CLEVELAND OHIO DEPT OF PHYSICS
MAGNETO-ACOUSTIC ABSORPTION IN SOLIDS.
Final rept.,
by Joseph Trivisonno. Jun 65, 10p. Contract AF AFOSR224 62 Proj. 9763 Task 976303
AFOSR , 65-1483
Unclassified report

Descriptors: (*Alkali metals, Elasticity), (*Acoustics, Magnetic fields), (*Single crystals, Ultrasonic properties), Potassium, Sodium, Rubidium, Low-temperature research, Magnesium, Crystal growth, Ultrasonic radiation, Attenuation, Absorption

The elastic constants of 3 alkali metals were measured as a function of temperature. The ultrasonic pulse-echo technique was used to measure potassium in the temperature range 4.2-195K and sodium in the range 78-300K. Results were in good agreement with other published data. Single crystals of rubidium were grown by a modified Bridgeman technique in an argon atmosphere; elastic constants were not obtained, however, due to an inability to orient crystals by x-ray techniques. Magneto-acoustic measurements were made on crystals of potassium at 10, 30, and 50 mc/sec to obtain dimensions of Fermi surface; change in attenuation with magnetic field was also measured. Ultrasonic attenuation measurements were also conducted on magnesium single crystals at 10-290 mc/sec. A list of the publications and these emanating from this grant are presented. (Author)

AD-621 138 **See Fld. 20/3**

AD-621 141 Div. 25/6 ,8/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J
HOT-SPOT MESOPLASMA FORMATION IN SILICON PLANAR TRANSISTORS.
Technical rept.,
by E. B. Hakim. Jun 65, 20p. Rept. no. ECOM-2605
Proj. 1P6 22001A056 Task 1P6 22001A05601
Unclassified report

Descriptors: (*Reliability (Electronics), Transistors), (*Transistors, Thermal stresses), (*Silicon, Transistors), Semiconductor devices, Metal coatings, Gold, Aluminum, Heat, Degradation, Secondary emission, Light, Electron microscopy, Infrared scanning, Failure (Mechanics)

A model is presented to explain the cause of mesoplasmas when secondary breakdown occurs in silicon planar transistors. An analysis of both aluminum and gold metalized devices is presented. To substantiate the model, data are presented from experiments using an electron microprobe and an infrared scanner, both used to analyze the second breakdown sites. Two areas of investigation are suggested which may prove effective in reducing the destructive effects of hot spots and mesoplasmas in transistors. (Author)

AD-621 152 **See Fld. 14/2**

AD-621 168 Div. 25/6
HUGHES AIRCRAFT CO FULLERTON CALIF GROUND SYSTEMS GROUP
ON ASYMMETRIC BUCKLING OF SHALLOW SPHERICAL SHELLS.
Revised ed.,
by H. J. Weinitschke. 25 Feb 65, 24p.
Unclassified report

Pub. in Journal of Mathematics and Physics v44 n2 p141-63 Jun 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript submitted 6 Aug 64.

Descriptors: (*Structural shells, Buckling (Mechanics)), (*Spheres, Buckling (Mechanics)), Deformation, Loading (Mechanics), Mathematical analysis, Differential equations, Series, Stresses

The buckling problem is examined by introducing asymmetric modes of deformation. It is assumed that the shell deforms axisymmetrically until a critical load is reached. At this load bifurcation of the solution occurs: an axisymmetric branch of solutions, which in general represents unstable states of equilibrium beyond the point of bifurcation, and a nonsymmetric branch of solutions representing adjacent equilibrium positions that cause the shell to buckle. The smallest load pc for which bifurcation occurs is considered the stability limit. Mathematically, this leads to an eigenvalue problem in much the same way as in other shell stability analysis. The main result of the paper is an asymmetric stability curve that shows the variation of pc with the shell geometry.

AD-621 194 **See Fld. 11/9**

AD-621 205 Div. 25/6
LINCOLN LAB MASS INST OF TECH LEXINGTON
FIELD EFFECT ON MAGNETORESISTANCE OF N-TYPE INDIUM ANTIMONIDE,
by Kawaji Shinji, Howard Huff, and Harry C. Gatos. 21 Jan 65, 11p. Rept. no. JA-2523
Contract AF19 628 5167
ESD , TDR-65-431

Unclassified report

Pub. in Surface Science, v3 p234-42 1965. (Copies available only to DDC users).

Descriptors: (*Indium alloys, Antimony alloys), (*Semiconductors, Resistance (Electrical)), Electric fields, Magnetic fields, Magnetic properties, Temperature, Electric currents, Surface properties

The field effect on the magnetoresistance of n-type indium antimonide was studied for various temperatures and magnetic fields. It was found that the ratio of the surface mobility to the bulk mobility decreases with increasing magnetic field beyond a given value of the magnetic field. This phenomenon is attributed to the quantization of the motion of electrons in the presence of an electric and magnetic field. (Author)

AD-621 206 See Fld. 9/1

AD-621 218 See Fld. 20/2

AD-621 220 Div. 25/6 ,17/2
CFSTI Prices: HC $1.00 MF $0.50
ARMY MATERIALS RESEARCH AGENCY WATERTOWN MASS
A RELATION BETWEEN MAXIMUM LOAD AND NECKING IN A TENSILE TEST AND A NECKING CORRECTION FOR FLOW STRESS.
Technical rept.,
by Albert A. Warnas. Oct 64, 14p. Rept. no. AMRA-TR-64-35
Proj. DA1L013001A91A

Unclassified report

Descriptors: (*Tensile properties, Theory), (*Loading (Mechanics), Deformation), (*Deformation, Loading (Mechanics)), Tensile properties, Corrections, Stresses, Ductility, Steel, Extensometers, Mathematical analysis, Strain (Mechanics), Tests

Experiments on soft SAE 1018 steel have shown general agreement with formulae proposed by Beeuwkes stating that incipient necking occurs at a significant strain beyond the maximum load in body-centered cubic metals during a tensile test. The Bridgman necking correction formula (using e - e sub n equal to a/R) applied from incipient necking was not in as good agreement with the experimental data as that of Beeuwkes. The results obtained justify a straight-line extrapolation of the true stresstrue strain curve to represent the corrected flow stressflow strain values from the incipient necking point to fracture when the curve is plotted on a semiarchyperbolic sine graph. (Author)

AD-621 261 Div. 25/6 ,17/7
TEXAS UNIV AUSTIN DEPT OF CHEMICAL ENGINEERING
THERMOELECTRIC AND ELECTRICAL MEASUREMENTS IN THE LA-TE SYSTEM,
by T. H. Ramsey, H. Steinfink, and E. J. Weiss.
1 Jun 64, 8p. Contract AF AFOSR62 237 Proj. 9761 Task 976102
AFOSR , 65-1384

Unclassified report

Pub. in Journal of Applied Physics v36 n2 p548-53 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Semiconductors, Electrical properties), (*Lanthanium alloys, Tellurium alloys), Intermetallic compounds, Thermoelectricity, Solid solutions, Resistance (Electrical), Electrical conductance, Powder alloys

An evaluation of the electrical conductivity and Seebeck coefficient of the compounds in the La-Te system has indicated values of rho from 0.1 Omega 20,000 Omegacm. The bonding, based on earlier crystal-chemical studies and supported by this evaluation, indicates a variation from almost pure metallic in LaTe to metallic with a substantial ionic component in La2Te3. An evaluation of the Seebeck coefficient has further differentiated between the purely metallic and semiconducting nature of the various compounds. The evaluation was conducted on polycrystalline pressed-powders or sintered materials, and the energy-gap measurements are believed to be a measure of surface phenomena activation processes rather than an indication of true intrinsic character. (Author)

AD-621 297 Div. 25/6 ,4/4
TEXAS INSTRUMENTS INC DALLAS
DIRECT CONFIRMATION OF THE A-CENTER MODEL IN ZNS BY OBSERVATION OF HYPERFINE STRUCTURE IN EPR SPECTRA,
by T. L. Estle, W. C. Holton, J. Schneider, A. Rauber, and B. Dischler. 24 Nov 64, 4p. Contract AF49 638 1250 Proj. 9761 Task 976103
AFOSR , 65-1180

Unclassified report

Pub. in Journal of Chemical Physics v42 n5 p1839-41 1 March 1965. (Copies not available to DDC or Clearinghouse customers). Research conducted in cooperation with Institut fur Elektrowerkstoffe, Freiburg im Breisgau, Germany.

Descriptors: (*Zinc compounds, Paramagnetic resonance), (*Color centers, Paramagnetic resonance), (*Paramagnetic resonance, Zinc compounds), Sulfides, Impurities, Gallium, Bromine, Iodine, Hyperfine structure, Luminescence, West Germany

Electron paramagnetic resonance (EPR) studies are made of Ga-, Br-, and I-doped ZnS. EPR spectra of the self-activated center show resolved hyperfine structure with the impurity, thereby providing direct proof that the center responsible for the blue self-activated luminescence in ZnS is an associate of a zinc vacancy with a substitutional impurity from Group III or Group VII. (Author)

AD-621 303 Div. 25/6
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
MEASUREMENTS ON NIOBIUM-TIN SAMPLES IN 200-KG CONTINUOUS FIELDS,
by D. Bruce Montgomery, and William Sampson.
11 Dec 64, 6p. Contract AF49 638 1468 Proj. 9764
AFOSR , 65-1181

Unclassified report

Pub. in Applied Physics Letters v6 n6 p108-11 Mar 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Magnetic fields, Electric currents), (*Electric currents, Magnetic fields), (*Superconductors, Magnetic properties), Niobium, Tin, Electric fields, Direct current, Cryogenics, Impurities

Measurements are made of the critical current as a function of applied magnetic field on several samples of niobium-tin at 4.2 K in dc fields as high as 201 kG. The measurements allow a determination of the upper-critical field, even of the best material, to within a few percent. The data also reveal the marked deviation of some materials at high fields from the defect-limited currents of the Lorentz-force model, and indicate a parabolic approach to H sub c2. (Author)

AD-621 308 See Fld. 20/6

AD-621 309 Div. 25/6 ,25/2
ILLINOIS UNIV URBANA DEPT OF ELECTRICAL ENGINEERING
VAPOR-LIQUID-SOLID GROWTH OF GALLIUM PHOSPHIDE,
by N. Holonyak,Jr., C. M. Wolfe, and J. S. Moore.
18 Jan 65, 5p. Contract AF19 628 4337 ,AF49 638 417 Proj. 9763 Task 976302
AFOSR , 65-1179

Unclassified report

Pub. in Applied Physics Letters v6 n4 p64-5 Feb 15 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Gallium alloys, Phosphorus alloys), (*Phosphorus alloys, Gallium alloys), Intermetallic compounds, Single crystals, Crystal growth, Vapors, Liquids, Solids

The successful vapor-liquid-solid (VLS) growth of GaP whiskers, rods, and blades is described. This lends confirmation to the generality of the VLS mechanism. It is suggested that the VLS mechanism can play a role in the growth of single crystal III-V compounds by affording an alloy at a step where the products from the halide vapor transport may deposit preferentially, cause supersaturation in the alloy, the nucleate on the crystal. (Author)

AD-621 321 Div. 25/6
TECHNISCHE HOCHSCHULE STUTTGART (GERMANY)
THE DISLOCATION AS A FUNDAMENTAL NEW CONCEPT IN CONTINUUM MECHANICS,
by Ekkehart Kroner. 1963, 11p.

Unclassified report

Pub. in Materials Science Research v1 p281-90 1963 (Copies not available to DDC or Clearinghouse customers). The Proceedings of the Research Conference on Structure and Properties of Engineering Materials at North Carolina State Coll., Raleigh, 12-13 Mar 62.

Descriptors: (*Crystal lattice defects, Continuum mechanics), (*Continuum mechanics, Crystal lattice defects), Solid state physics, Elasticity, Crystal structure, Materials

The main object of this paper is to give the connection between macro and micromechanics (or continuum mechanics and solid state physics) as far as it can be delineated today. The theory of the residual stress state is rather well-developed. The state is described geometrically by elastic strain and lattice curvature, the latter being equivalent to the dislocation density. The static description uses force and couple stresses, the latter being the reaction of the body against the lattice curvature. The material constant connecting bending-type lattice curvature with the corresponding couple stress is derived by applying elasticity theory on the microscopic scale. The material constant depends on the ordinary elastic constants of the body and on the distance of the glide planes of the dislocations. Beside these positive results, the paper contains an outline of what still has to be done. (Author)

AD-621 340 See Fld. 13/13

AD-621 342 Div. 25/6
TECHNION - ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
BUCKLING OF UNSTIFFENED CONICAL SHELLS UNDER COMBINED TORSION AND AXIAL COMPRESSION OR TENSION,
by A. Berkovits, and J. Singer. 15 Dec 64, 10p.
Contract AF EOAR62 61 ,AF EOAR63 58
AFOSR , 65-1235

Unclassified report

Pub. in Israel Journal of Technology v3 n1 p15-24 1965 (Copies available only to DDC users). Proceedings of the Israel Annual Conference on Aviation and Astronautics (no. 7), Feb 65.

Descriptors: (*Buckling (Mechanics), Structural shells), (*Conical bodies, Buckling (Mechanics)), (*Structural shells, Buckling (Me-

chanics)), Compressive properties, Stability, Loading (Mechanics), Cylindrical bodies, Aluminum alloys, Functions, Israel

A method developed previously by the second author is extended to the analysis of the instability of isotropic conical shells under combined torsion and axial compression or tension. The method is based on solution of modified Donnell type stability equations, in the presence of slightly relaxed boundary conditions for the u and v displacements. Typical examples are calculated, and theoretical interaction curves for combined loading are presented and compared with the interaction curve for cylindrical shells. An experimental program was conducted in order to determine the shape of the interaction curves for combined torsion and axial compression of isotropic conical shells. Results of combined loading tests on unstiffened aluminum alloy shells are presented. The results indicate a parabolic interaction function between torsional and compression buckling strength, similar to the empirical interaction function generally obtained for cylinders. This was to be expected in view of the similarity of the theoretical interaction curves for cones and cylinders as presented. (Author)

AD-621 362 See Fld. 9/1

AD-621 402 Div. 25/6 ,15/1
MASSACHUSETTS INST OF TECH CAMBRIDGE
NOTE ON VARIATIONAL PRINCIPLES IN ELASTICITY,
by E. Reissner. 4 Jul 64, 3p.

Unclassified report

Pub. in International Journal of Solids and Structures v1 p93-5 1965 (Copies available only to DDC users).

Descriptors: (*Elasticity, Calculus of variations), (*Calculus of variations, Elasticity), Boundary value problems, Stresses, Strain (Mechanics)

The author is concerned with a class of extensions of known variational principles for boundary value problems of differential equations of elasticity. The principal purpose of the note is the formulation of two variational equations in which the three moment equilibrium equations for components of stress are Euler equations of a variational principle rather than equations of definition.

AD-621 411 Div. 25/6 ,25/2
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
PRESSURE DEPENDENCE OF PHONON ASSISTED INTERBAND TUNNELING,
by H. Fritzsche, and J. J. Tiemann. 1964, 6p.
Contract AF AFOSR148 63 Proj. 9763 Task 976302
AFOSR , 65-1183

Unclassified report

Pub. in proceedings of the International Conference on Semiconductor Physics (7th), Paris, France, 19-24 Jul 64, p599-603 (Copies available only to DDC users).

Descriptors: (*Tunneling (Electronics), Phonons), (*Stresses, Tunneling (Electronics)), Hydrostatic pressure, Crystal lattices, Germanium, Antimony, Cryogenics

Since very much is known about the band structure of germanium and of its dependence on stress, one can expect to obtain detailed information about the interband tunneling process by studying the effect of stress on the tunneling characteristics. Some structure has been briefly noted in the bias dependence of the relative change of tunneling current with hydrostatic pressure, in Sb-doped germanium tunnel junctions at 4.2 K. This effect is re-examined and it is shown that it cannot be explained by the Keldysh-Kane theory. Tunneling in germanium between states near the top of the valence band at the zone center and near the bottom of the conduction band at k = pi/a (1,1,1) can only occur if the difference in crystal momenta is supplied either by an interaction of the electron with an impurity or by a simultaneous emission or absorption of a (1 1 1) BZ edge phonon. Investigation was restricted to Sb-doped germanium for which the central cell potential of the impurities is so weak that the impurity-induced tunneling can be neglected. At helium temperatures, only phonon emission processes have to be considered. As a consequence the I-V curves show the characteristic phonon structure at the threshold voltages V = h omega/2epi and the contributions to the tunneling current of the TA, LA, LO and TO (1 1 1) phonons can easily be separated. (Author)

AD-621 417 Div. 25/6
SYRACUSE UNIV N Y
LOCAL BUCKLING OF SHELLS,
by R. M. Evan-Iwanowski, T. C. Loo, and D. W. Tierney. 1962, 32p. Contract AROD DA31 124 61G24
AROD , 2465:6

Unclassified report

Pub. in Developments in Mechanics Proceedings of the Midwestern Mechanics Conference (8th) p221-51 Apr 1-3 1963 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Structural shells, Buckling (Mechanics)), (*Buckling (Mechanics), Structural shells), Loading (Mechanics), Deformation, Theory, Mathematical analysis, Graphics, Experimental data, Spheres, Structural properties

This paper is concerned with the experimentally observed phenomenon of local buckling in curved two-dimensional manifolds. A detailed experimental exposition of this phenomenon in spherical shells is herein presented. Local buckling in a shell is a transitional type of instability. It occurs under the action of certain systems of loadings, such as line ring loads, two normal concentrated loads and single concentrated loads located near the edge of a shell. With these respective loadings local buckling is characterized by instability in the portion of a shell contained by the line ring load, in an area between the two point load, and along that portion of the edge nearest to the point of application of the single concentrated load. In order to provide an insight into a possible mechanism of local buckling of shells, an analysis of a pinned shallow arch, subjected to two normal concentrated loads is presented. Of special interest are the deformation curves shown, which indicate that although shallow arches do exhibit transitional instability, they do not indicate the presence of local buckling. (Author)

AD-621 420 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
THE FORMATION OF F-CENTERS IN SOLID SOLUTIONS OF KC1-KBR,
by I. Ya. Melik-Gaikazyan, and D. I. Vaisburd. Oct 64, 7p. Rept. no. T-R-452
Contract AF19 628 3880
TT , 65-63973

Unclassified report

K Obrazovaniyu F-Tsentrov v Tverdykh Rastvorakh KC1-KBr. Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Fizika (USSR) n6 p174-6 1962.

Descriptors: (*Solid solutions, Color centers), (*Color centers, Density), (*Potassium compounds, Color centers), Single crystals, Chlorides, Bromides, X rays, Crystal lattice defects, USSR

The relationships of F-center concentration in Kcl-KBr solid solutions to x-ray exposure and to solid solution percentage composition were determined. The typical concentration vs. exposure plot shows a rapid nonlinear initial growth of F-centers, followed by a slow linear growth. F-center concentration was found to decrease nearly additvely with increasing KBr content.

AD-621 424 Div. 25/6
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
INTRODUCTION OF MICROIMPURITIES INTO SINGLE CRYSTALS OF CDS DURING THEIR GROWTH AND SOME CHARACTERISTICS OF THE ALLOYED SAMPLES (VVEDENNIA MIKRODOMISHOK V MONOKRYSTALY CDS V PROTSESI IKH ROSTU TA DEIAKI KHARAKTERYSTYKY LEGOVANYKH ZRAZKIV).
Research translation,
by B. M. Bulakh, and I. B. Mizetska. Sep 64, 9p. Rept. no. T-U-3
Contract AF19 628 3880
TT , 65-63977

Unclassified report

Trans. of Ukrayinskyii Fizychnyi Zhurnal (USSR) v7 n10 p1125-7 1962.

Descriptors: (*Semiconductors, Impurities), (*Cadmium compounds, Sulfides), (*Single crystals, Semiconductors), Germanium, Gold, Silver, Copper, Chlorine, Crystal growth, Photosensitivity, Photoconductivity, USSR

The object of the work was to develop a method of alloying single crystals of CdS during their growth and to study the effect of microimpurities on certain physical properties of the alloyed semiconductors.

AD-621 427 Div. 25/6
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
FLUX METHODS FOR THE ANALYSIS OF TRANSPORT PROBLEMS IN SEMICONDUCTORS IN THE PRESENCE OF ELECTRIC FIELDS,
by J. P. McKelvey, and J. C. Balogh. 7 Oct 64, 10p. Contract AF AFOSR73 63 Proj. 9761 Task 9761 01
AFOSR , 65-1182

Unclassified report

Pub. in The Physical Review v137 n5A p1555-61 Mar 1 1965.

Descriptors: (*Semiconductors, Transport properties), (*Transport properties, Electrons), Electric fields, Thermal diffusion, Field theory, Boundary value problems, Integral equations

A calculational technique based upon the detailed study of flux interactions between various parts of a diffusionrecombination system, whose foundations have been discussed elsewhere in the literature, is extended to include cases where electric fields may be acting upon the particles of the system. The analysis is worked out in detail for systems obeying Boltzmann statistics in which the field satisfies the condition mu E << c, where c is the mean thermal velocity. Analytic solutions for the reflection and transmission coefficients of a sheet of material of arbitrary thickness for incident carriers are worked out for constant electric fields; approximate or numerical methods are applicable for nonconstant fields. The effect of the details of scattering and recombination processes upon the solutions is considered. A simple example is worked out to exhibit areas of agreement between this method and the more conventional calculational techniques and to demonstrate certain advantages in generality and conceptual simplicity associated with the flux method. (Author)

AD-621 487 See Fld. 20/13

AD-621 488 See Fld. 20/6

AD-621 489 Div. 25/6
CFSTI Prices: HC $6.00 MF $1.25
FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA

ULTIMATE STRENGTH OF LONGITUDINALLY STIFFENED PLATE PANELS, SUBJECTED TO COMBINED AXIAL AND LATERAL LOADING.
Engineering lab. rept.,
by Jun Kondo. Aug 65, 210p. Rept. no. EL-248.13
Contract NObs90041

Unclassified report

Descriptors: (*Panels (Structural), Tensile properties), (*Loading (Mechanics), Panels (Structural)), Hydrostatic pressure, Deformation, Stresses, Reinforcing materials, Mathematical analysis

The report presents results of an analytical investigation of the ultimate strength of longitudinally stiffened plate panels. The load considered were the axial load applied to the ends and the hydrostatic pressure acting on the plate surface. Under these external loads, longitudinally stiffened plate panels fail due to excessive bending and can be treated as beam-columns if local buckling of the plate components is prevented. The analysis was performed by solving the equilibrium equations numerically. Consideration was given to the nonlinear effects of both the inelastic action and deformation. The factors which have an effect on the ultimate strength were found to be: (a) Yield stress of material, (b) Residual stresses in both magnitude and distribution, (c) Ratio of stiffener cross-sectional area to plate area, (d) Ratio of stiffener flange area to stiffener area, (e) Ratio of stiffener depth to plate thickness, (f) Intensity of hydrostatic pressure. In the nondimensionalized Ultimate Axial-Load--Lateral Load-Panel Length relationship, the interelation between these geometric ratios was found to be practically negligible. (Author)

AD-621 533 **See Fld. 13/10**

AD-621 553 Div. 25/6 ,13/4 ,14/6
CFSTI Prices: HC $2.00 MF $0.50
FOREST PRODUCTS LAB MADISON WIS
BUCKLING COEFFICIENTS FOR SANDWICH CYLINDERS OF FINITE LENGTH UNDER UNIFORM EXTERNAL LATERAL PRESSURE.
Research note,
by E. W. Kuenzi, B. Bohannan, and G. H. Stevens. Sep 65, 26p. Rept. no. RN-FPL-0104
Contract AF33 615 65-5002

Unclassified report

This Report is One of a Series Issued in Cooperation with the MIL-HDBK-23 Working Group on Composite Construction for Flight Vehicles of the Depts. of the Air Force, Navy, and Commerce.

Descriptors: (*Structural shells, Sandwich construction), (*Buckling (Mechanics), Structural shells), Cylindrical bodies, Differential equations, Graphics, Pressure

The paper contains curves of buckling coefficients and formulas for the calculation of the critical external pressure of finite length, circular cylindrical shells with sandwich walls. The facings of the sandwich are isotropic, of equal or unequal thickness, of the same or different material, and their individual stiffness is not taken into account. The sandwich core is isotropic or orthotropic having natural axes in the axial, tangential, and radial directions of the cylinder. If the cores are very rigid, the method yields results that are substantially those of von Mises. (Author)

AD-621 556 **See Fld. 20/6**

AD-621 598 Div. 25/6 ,20/1
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO)
THE FERMI SURFACE OF CAESIUM,
by K. Okumura, and I. M. Templeton. 25 Jan 65, 17p. Rept. no. NRC-8560

Unclassified report

Pub. in Proceedings of the Royal Society, A, v287 p89-104 1965 (Copies available only to DDC users).

Descriptors: (*Cesium, Atomic energy levels), (*Atomic energy levels, Cesium), Canada, Solid state physics, Anisotropy, Cryogenics, Thermoelectricity, Magnetic fields, Vibration

A study of the de Haas-Van Alphen effect in caesium by the pulsed field method, under carefully controlled experimental conditions, has yielded information about the orientation dependence of the Fermi surface cross-section. A computer analysis of the results in terms of cubic harmonic series has indicated a probable radial distortion of some +3.3% in the (110) direction, -0.9% in the (100) direction, and -1.4% in the (111) direction; this is compared with the predictions of band structure calculations which, though indicating approximately the correct shape of Fermi surface, are appreciably in error as to the magnitude of the deviations from a sphere. The observed Fermi surface distortion is also discussed in terms of its effect on the low temperature thermoelectric power of caesium. The volume of the Fermi surface is found to be within a few tenths of 1% of that calculated from published lattice constant data. Strong variations of signal strength with orientation were observed; these have been attributed in part to the effect of spin-splitting of the Landau levels. (Author)

AD-621 602 **See Fld. 20/3**

AD-621 606 Div. 25/6 ,17/7 ,25/2
JOHN CARROLL UNIV CLEVELAND OHIO
LOW TEMPERATURE ELASTIC CONSTANTS OF POTASSIUM.
Revised ed.,
by W. R. Marquardt, and J. Trivisonno. 23 Jul 64, 9p. Contract AF AFOSR862 65 Proj. 9763 Task 976303
AFOSR , 65-1193

Unclassified report

Pub. in J. Phys. Chem. Solids v26 p273-8 1965 (Copies available only to DDC users). Revision of manuscript submitted 13 Jul 1964.

Descriptors: (*Potassium, Elasticity), (*Elasticity, Low-temperature research), Cryogenics, Single crystals, Anisotropy, Density, Measurement

The adiabatic elastic constants of single crystal potassium were measured as a function of temperature from 195 K to 4.2 K by the ultrasonic pulse-echo technique. The measured elastic constants at 4.2 K (in units of 10 to the 10th power dyn-cm 2) are as follows: C = 2.86, C' = 0.377, C sub n = 6.65, and B sub s = 3.66. The shear constants C and C' are interpreted in terms of Fuchs electrostatic contribution to the shear stiffnesses of the alkali metals. Significantly, this work yields an elastic anisotropy, C/C', at 4.2 K which is in agreement with Fuchs' theoretical calculation. The results are also compared to Bender's values of the elastic constants at 83 K and with Swenson's isothermal compressional data.

AD-621 610 **See Fld. 20/13**

AD-621 613 Div. 25/6 ,25/3
CORNELL UNIV ITHACA N Y LAB OF ATOMIC AND SOLID STATE PHYSICS
EFFECT OF MANY-BODY INTERACTIONS ON THE TEMPERATURE-DEPENDENT AMPLITUDE OF DE HAAS-VAN ALPHEN OSCILLATIONS.
Technical rept.,
by J. W. Wilkins, and J. W. F. Woo. 31 May 65, 3p. Rept. no. TR-6
Contract Nonr40138

Unclassified report

Pub. in Physics Letters v17 n2 p89-90 Jul 1 1965 (Copies available only to DDC users). Complete text available from CFSTI HC$1.00, MF$0.50, as AD-615 594.

Descriptors: (*N-body problem, Oscillation), (*Oscillation, Temperature), (*Magnetic properties, Metals), Band spectrum, Electrons, Phonons, Fermions

Improvements in experimental techniques permit the measurement of the temperature dependence of the amplitude of de Haas - van Alphen oscillations. It is shown that at low temperatures when many-body effects are included the mass should be the band structure effective mass corresponding to the cyclotron orbits associated with the de Haas-van Alphen oscillation enhanced by electron-phonon interactions.

AD-621 615 **See Fld. 11/6**

20/13. THERMODYNAMICS

AD-620 831 **See Fld. 20/3**

AD-620 838 Div. 25/8 ,30/3
CFSTI Prices: HC $2.00 MF $0.50
AIR FORCE CAMBRIDGE RESEARCH LABS BEDFORD MASS
HEAT TRANSFER CONSIDERATIONS IN THE TEMPERATURE CONTROL OF INSTRUMENTATION PACKAGES AT HIGH ALTITUDES.
Instrumentation papers,
by Arnold Piacentini, Kenneth H. Lindenfelser, and Darrel E. Dube. Jun 65, 33p. Rept. no. AFCRL-65-380 ,IP-64
Proj. 6665 Task 666506

Unclassified report

Descriptors: (*Heat transfer, Modules (Electronic)), (*Temperature control, Thermal insulation), (*Thermal insulation, Telemeter systems), Payload, Balloons, Instrumentation, Airborne, Heat transfer coefficients, Numerical analysis, Digital computers

A theoretical method for designing thermal packages used to house instrumentation carried aloft by high-altitude balloon vehicles was developed. Because of the odd package shapes and the constantly varying boundary conditions, a numerical method of analysis was employed for the solution of the heat transfer equations. This approach allows the consideration of all pertinent variables, but its complexity requires a large number of computations. Accordingly, the problem was programmed for solution on a high-speed electronic digital computer. The computer program was initially written for a rectangular parallel package. Temperature distributions calculated from the flight-simulation program were compared to temperature distributions measured on actual balloon flights. It was concluded that the method developed is a reliable one. (Author)

AD-620 863 Div. 25/8 ,9/5
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INTERACTION OF THE BOUNDARY LAYER WITH AN EXTERNAL FLOW CAUSED BY RADIATIVE HEAT TRANSFER,
by V. V. Lunev, and A. N. Rumynskii. 9 Aug 65, 23p. Rept. no. FTD-TT-65-958
TT , 65-63873

Unclassified report

Unedited rough draft trans. of Zhurnal Prikladnoi Mekhaniki i Tekgnicheskoi Fiziki (USSR) v7 n6 p44-53 1961.

Descriptors: (*Wedges, Laminar boundary layer), (*Thermal radiation, Hypersonic flow), Convection, USSR, Shock waves, Boundary layer, Thickness

The laminar boundary layer on the surface of a wedge streamlined by a hypersonic flow of radiative gas is studied with the assumption that the effect of radiation on gas flow in the disturbed region is small. It is assumed that gas radiation is inde-

pendent of its motion in front of the density shock. Only that range of temperatures where the radiation pressure and density of radiant energy may be neglected is considered. In order to separate the effect of interaction of the boundary and shock layers brought about by radiant heat exchange the boundary layer is considered to be thin and the effect of its displacement thickness on the shape and parameters of the shock wave is neglected. The temperature of the wedge surface Tw, the Prandtl number P and the product of gas viscosity times its density are taken constant.

AD-620 895 See Fld. 21/2

AD-620 980 Div. 25/8 ,4/4
LINCOLN LAB MASS INST OF TECH LEXINGTON
PARTIAL PRESSURES OF HG (G) AND TE2 (G) IN HG-TE SYSTEM FROM OPTICAL DENSITIES,
by R. F. Brebrick, and A. J. Strauss. 24 Nov 64, 15p.

Unclassified report

Pub. in The Journal of Physics and Chemistry of Solids v26 p989-1002 1965 (Copies available only to DDC users).

Descriptors: (*Mercury, Vapor pressure), (*Tellurium, Vapor pressure), Vapors, Optical properties, Liquid metals, Phase studies, Thermodynamics

The partial pressures of Hg (g) and Te2 (g) in equilibrium with Hg-saturated HgTe (c), Te-saturated HgTe (c), and some Hg-Te melts between about 400 and 700C were determined by measuring the optical density of the coexistent vapor as a function of wavelength. In agreement with mass spectrographic data, no evidence was obtained for HgTe (g) molecules. The partial pressures of the elements depend strongly on the composition of the solid phase. The maximum value of pHg in equilibrium with HgTe (c) is 19 atm, the pressure over Hg-saturated HgTe (c) between 643 and 656C. At 670C, the maximum melting point, pHg = 12.5 atm. At any temperature Hg (g) is the predominant vapor species over HgTe (c) of any composition. Liquidus temperatures for compositions between 31 and 58.5 at. %Te have been obtained from the partial pressure data, which also show that at 488C Hg-saturated HgTe (c) contains 49.9= 0.2 at.% Te and Te-saturated HgTe (c) contains less than 50.5 at.% Te. The Gibbs free energy of formation of HgTe (c) from Hg (g) and Te2 (g), which is practically independent of the composition of the solid phase, is found to be -41.66+42.71 (0.001) T kcal/mole. (Author)

AD-620 983 See Fld. 21/8

AD-621 037 See Fld. 20/12

AD-621 113 See Fld. 20/3

AD-621 123 See Fld. 18/9

AD-621 152 See Fld. 14/2

AD-621 213 See Fld. 20/3

AD-621 243 Div. 25/8 ,9/6 ,9/7 ,9/5
CFSTI Prices: HC $6.00 MF $1.25
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF MECHANICAL ENGINEERING
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF ANNULAR INJECTION OF HELIUM INTO A SUPERSONIC AIR CORE.
Doctoral thesis,
by Clarence Albert Kemper. May 62, 208p.
Contract AF49 638 442 Proj. DSR7962
AFOSR , 3493

Unclassified report

Descriptors: (*Supersonic flow, Thermodynamics), Adiabatic gas flow, Helium, Injection, Jets, Enthalpy, Boundary layer, Temperature, Cooling, Stagnation point

When a lightweight gas is injected into the boundary layer of a high-speed air flow, the adiabatic wall temperature is reduced by means of a change in properties of the gas in the region where viscous dissipation occurs. The paper summarizes some of the results of a controlled experiment in which helium was injected through an annular slot and along the impermeable surface of a 1.46 inch diameter tube in which a supersonic air stream was flowing at a Mach number of about 4.8. A discussion of some of the analytical results which were obtained is also given. The experimental portion of the investigation included the development of miniaturized boundary layer instrumentation capable of measuring velocity, temperature, and concentration profiles of the flow.

AD-621 254 See Fld. 7/4

AD-621 257 See Fld. 20/2

AD-621 262 See Fld. 7/4

AD-621 273 See Fld. 12/1

AD-621 274 See Fld. 12/1

AD-621 364 Div. 25/8 ,25/7
CFSTI Prices: HC $2.00 MF $0.50
HARVARD COLL CAMBRIDGE MASS PRESIDENT AND FELLOWS
RADIATIVE TRANSFER IN LINES FOR MEDIA IN STATISTICAL EQUILIBRIUM.
Scientific rept.,
by Wolfgang Kalkofen. 25 Jun 65, 32p. Rept. no. SR-2
Contract AF19 628 3877 Proj. 8647 Task 864701
AFCRL , 65-347

Unclassified report

Descriptors: (*Kinetic theory, Statistical mechanics), (*Wave transmission, Gases), (*Electron transitions, Line spectrum), Thermodynamics, Atomic energy levels, Electron density, Differential equations, Integral equations

The line transfer problem is discussed for a two-level atom and extended to an N-level atom. For N = 2 the source function is obtained, and non-linear and linear integro-differential equations are derived expressing the transfer problem subject to the condition of statistical equilibrium. From the differential equation the corresponding integral equations for the line source function are determined, and the integral kernels are discussed for the case of depth-dependent absorption profiles. The line components of the source function are derived for an N-level atom. The corresponding coupled integral equations for the resonance line components of the source function are discussed for the limit of low temperatures, and a method of solution is outlined. An analytic solution is obtained for the case of constant coefficients and integral kernels which are single exponential functions. (Author)

AD-621 396 Div. 25/8
EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZURICH (SWITZERLAND) INSTITUT FUER AERODYNAMIK
THE ROLE OF ENTROPY IN THE AEROSPACE SCIENCES.
Daniel and Florence Guggenheim Memorial Lecture no. 2,
by Jakob Ackeret. 1960, 17p.

Unclassified report

Presented at The International Congress of the Aeronautical Sciences (2nd), Zurich, Switzerland, 12 Sep 1960. Pub. in Journal of The Aerospace Sciences v28 n2 p81-96 Feb 1961 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Entropy, Aeronautics), (*Aerodynamic characteristics, Entropy), Heat engines, Reviews, Gas flow, Shock waves, Molecular properties, Chemical equilibrium, Propulsion systems, Switzerland

Principle topics discussed are: the work of Carnot and Clausius; enthalpy and free enthalpy - the ideal heat engine; propulsion in the void; entropy in gas flow; entropy in shock waves; structure of shock waves; connections between entropy and molecular theory; chemical equilibrium; nonequilibrium states.

AD-621 398 Div. 25/8
STANFORD UNIV CALIF DEPT OF CHEMISTRY
STATISTICAL THERMODYNAMICS OF LIQUID MIXTURES,
by P. J. Flory. 20 Nov 64, 8p. Contract AF49 638 1341 Proj. 9760 Task 976003
AFOSR , 65-1449

Unclassified report

Pub. in Journal of the American Chemical Society v87 n9 p1833-8 May 5 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Liquids, Thermodynamics), (*Thermodyanmics, Statistical analysis), Mixtures, Molecules, Entropy, Thermal expansion, Enthalpy

Liquid mixtures of nonpolar molecules are treated on the basis of a simple partition function affording an approximate, but satisfactory, representation of liquid state properties. Parameters characterizing the pure components (specifically, the density, thermal expansion coeffient, and thermal pressure coefficient) are thus brought to bear on the analysis of properties of mixtures. Theoretical expressions for the 'equation of state' contributions to the free energy, enthalpy, entropy, chemical potential, and excess volume are derived. The theoretical entropy of mixing in excess of the combinatorial, or 'ideal,' entropy depends on the reduced volumes of the two components and of the mixture; it does not vanish, in general, when the excess volume is reduced to zero, contrary to a tenet of regular solution theory. The treatment is applicable to mixtures of molecules differing in size. (Author)

AD-621 423 Div. 25/8 ,14/2
CFSTI Prices: HC $1.00 MF $0.50
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
EXPERIMENTAL DETERMINATION OF THE ENTHALPY, TEMPERATURE, AND HEAT OF PHASE TRANSITION OF THE ALPHA-MODIFICATION OF A1203 IN THE TEMPERATURE RANGE OF 1200 TO 2500 DEGREES K,
by P. B. Kantor, L. S. Lazariev, V. V. Kandiba, and Ie. M. Fomichov. Oct 64, 12p. Rept. no. T-U-2
Contract AF12 628 3880
TT , 65-63976

Unclassified report

Eksperymentalne Vyznachennia Entalpyi, Temperatury i Teploty Fazovogo Perekhodu Alpha-Modyfikatsyi Okysu Aliuminiyu A1203 pry Temperaturakh 1200-2500K. Trans. of Ukrayinskyi Fizychnyi Zhurnal (USSR) v7 n2 p205-11 1962.

Descriptors: (*Corundum, Thermodynamics), (*Aluminum compounds, Oxides), Enthalpy, Temperature, Phase studies, High-temperature research, Calorimeters, Crystals, Molybdenum, Determination, USSR

An investigation was made of the enthalpy of the alpha-modification of A12O3 (corundum) at high temperatures with a view toward using it as a heat-capacity 'standard' for high-temperature calorimeter research. Corundum may be obtained in pure

form, has high chemical and thermal stability, and a high specific heat. Corundum has several crystalline modifications, of which the alpha-modification is the most widely distributed natural form, and may be produced synthetically. An investigation was made of samples of colorless corundum, consisting of crystals 30 mm long and 2 mm in diameter, and of 99.99% purity. Molybdenum capsules were employed in the experiments. It was shown that no reactions occur in the system Mo-Al2O3 at temperatures up to 2100K. It was also found (within experimental accuracy) that no reaction occurred in the hermetically sealed molybdenum capsules during measurements of the enthalpy of liquid corundum.

AD-621 471 Div. 25/8
COURANT INST OF MATHEMATICAL SCIENCES NEW YORK UNIV N Y
SOLUTION OF THE BOLTZMANN EQUATION IN AN UNBOUNDED DOMAIN,
by Harold Grad. 1965, 13p. Contract AF AFOSR266 62 Proj. 9749 Task 974901
AFOSR , 65-1357
Unclassified report

Pub. in Communications on Pure and Applied Mathematics v18 n1/2 p345-54 Feb/May 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Kinetic theory, Partial differential equations), Transport properties, Integral equations, Velocity, Gases, Gas flow

Infinite full three-dimensional space obviously generates no interference from boundary layers. For solutions of the linear Boltzmann equation in this domain, the technical point in obtaining a priori estimates is the vanishing of a certain boundary integral. For the rectangular box this is observed almost by inspection. In the unbounded domain it requires an additional estimate of a sufficiently rapid decay at infinity. In this report such an estimate is obtained. (Author)

AD-621 483 See Fld. 14/2

AD-621 487 Div. 25/8 ,25/6
CFSTI Prices: HC $3.00 MF $0.50
POULTER LABS STANFORD RESEARCH INST MENLO PARK CALIF
A SUMMARY OF THE SOVIET PAPERS ON THE HIGH PRESSURE EQUATION OF STATE OF METALS.
Technical rept.,
by Gordon D. Anderson. 15 Jun 65, 53p. Rept. no. TR-003-65
Contract AF29 601 6409
Unclassified report

Descriptors: (*Equations of state, Metals), (*High-pressure research, Metals), USSR, Hightemperature research, Shock (Mechanics), Shock waves, Data, Experimental data, Thermodynamics

The Russians have published some papers on the shock compression of metals in which fantastically high pressures and projectile velocities are reported. In order to describe their high pressure experimental results, the Soviet workers made some major modifications to the Mie-Gruneisen equation formerly used to describe metals. The main text of this report is a description of the experimental methods, handling of the data, and the equation of state models used to describe the behavior of metals at high pressures and temperatures. The numerical information presented in these papers has been collected and is presented. The experimental data such as measured shock velocities and flying plate velocities and quantities computed directly from these data by the Rankine-Hugoniot jump conditions are presented. On the basis of particular equation of state models suggested by the experimental data, thermodynamic quantities such as 0K isotherms, Gruneisen functions, and shock temperatures are calculated. These calculated results, as distinguished from direct experimental data, are collected and presented.

AD-621 502 See Fld. 11/6

AD-621 523 Div. 25/8 ,25/3
CFSTI Prices: HC $6.00 MF $1.50
CASE INST OF TECH CLEVELAND OHIO FLUID THERMAL AND AEROSPACE SCIENCES
THE THERMAL STABILITY OF COMPLETELY CONFINED FLUIDS INCLUDING MAGNETOHYDRODYNAMIC EFFECTS.
Scientific rept.,
by Michael Sherman, and Simon Ostrach. Jun 65, 293p. Rept. no. FTAS-TR-65-1
Contract AF AFOSR194 65 Proj. 9781 Task 978101
AFOSR , 65-1455
Unclassified report

Descriptors: (*Fluids, Thermal properties), (*Magnetohydrodynamics, Thermal properties), Stability, Dielectrics, Electrical conductance, Mathematical models, Theory, Numerical analysis, Boundary value problems, Heat transfer, Equations

The current research concerns the determination of the conditions needed to induce a state of convective motion in a fluid where a constant temperature gradient is directed parallel to a body force. The fluid is contained in a rather arbitrary region bounded by rigid walls. The principle of exchange of stability is established for arbitrary regions with a generalized thermal boundary condition on the bounding walls. The thermal stability problem is reduced to an eigenvalue problem for the critical Rayleigh number (the stability criterion) and then is reformulated as a variational principle. A method is developed for estimating upper and lower bounds to the critical Rayleigh number for regions in which the critical Rayleigh number cannot be calculated exactly. An extension of the thermal stability problem to include magnetohydrodynamic effects is presented. Here the fluid and the bounding walls are electrical conductors. A constant magnetic field is applied to the configuration. (Author)

AD-621 603 See Fld. 11/6

AD-621 610 Div. 25/8 ,25/6
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF PURE CHEMISTRY
THE MAGNETIC CONTRIBUTION TO THE HEAT CAPACITY OF NEODYNIUM AT LOW TEMPERATURES,
by V. Janovec, and J. A. Morrison. 17 Jun 65, 2p. Rept. no. NRC-8577
Unclassified report

Pub. in Physics Letters, v17 n3 p226-7 Jul 15 1965. (Copies available only to DDC users).

Descriptors: (*Thermodynamics, Neodymium), (*Neodymium, Thermodynamics), Cryogenics, Antiferromagnetism, Electron transitions, Specific heat, Magnetic properties, Thermal properties

An expression is given for the magnetic contribution to the total heat capacity for neodymium.

AD-621 615 See Fld. 11/6

20/14. WAVE PROPAGATION

AD-620 937 Div. 8/5
CFSTI Prices: HC $4.00 MF $1.00
ADCOM INC CAMBRIDGE MASS
STUDY OF RANDOM SCAN TV TRANSMISSION.
Final scientific rept. for 1 Jul 64-31 May 65,
by Philip A. Bello, Charles J. Boardman, Cesar A. Filippi, and Steven M. Sussman. 15 Jul 65, 135p. Rept. no. G-55-F
Contract AF19 628 4308 Proj. 4610 Task 461007
AFCRL , 65-535
Unclassified report

Descriptors: (*Video signals, Modulation), (*Modulation, Video signals), (*Demodulation, Video signals), (*Synchronization (Electronics), Video signals), Television receivers, Television transmitters, Correlators, Electromagnetism, Scanning, Electromagnetic waves, Wave transmission, S-band, X-band, Frequency modulation

The report is concerned with the study of the modulation-demodulation and synchronization problems arising in random-scan TV signals, which are characterized by the pseudo-random selection of the spacial positions of the TV elements. The transmission channels considered were troposcatter and line-of-sight propagation in the S- and X-Band. Both analog and digital modems were studied. Also, the modulation and synchronization problems of a simulated random scan based on a repetitive linear sweep followed by a point selector are discussed. (Author)

AD-620 966 See Fld. 17/7

AD-621 046 See Fld. 8/2

AD-621 061 Div. 8/6 ,5/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
RADIOWAVES IN SPACE.
26 Aug 65, 4p. Rept. no. FTD-TT-65-734
TT , 65-63946
Unclassified report

Unedited rough draft trans. of Sovetskii Patriot (USSR) p4 Dec 13 1964.

Descriptors: (*Space communication systems, Radio transmission), (*Radio waves, Propagation), Ionospheric propagation, Space environmental conditions, Electromagnetic waves, Attenuation, Space probes, USSR

Brief discussion on the propagation of radio waves in space communication systems.

AD-621 087 See Fld. 9/5

AD-621 103 Div. 8/6 ,8/2
NATIONAL RESEARCH COUNCIL OF CANADA OTTAWA (ONTARIO) DIV OF RADIO AND ELECTRICAL ENGINEERING
DISPERSION OF VERY SHORT MICROWAVE PULSES IN WAVEGUIDE.
Revised ed.,
by M. Ito. 1 Feb 65, 8p. Rept. no. NRC-8534
Unclassified report

Pub. in IEEE Transactions on Microwave Theory and Techniques p357-64 May 1965. Revision of manuscript submitted 17 Sep 64 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Waveguides, Radiofrequency interference), (*Radiofrequency interference, Waveguides), (*Microwaves, Waveguides), X band, Electromagnetic pulses, Propagation, Scattering, Frequency modulation, Spectrum analyzers

A very short carrier pulse propagating in waveguide is subject to dispersion which causes distortion of both the envelope and the carrier wave of the pulse. The results of a stationary phase analysis of the problem are presented and results of experimental work at X band are described. The spectral separation property of the dispersive line which enables it to operate as an elementary spectrum analyzer are discussed and experimental evidence demonstrating this property is presented. (Author)

AD-621 378 Div. 8/6
CFSTI Prices: HC $3.00 MF $0.75
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH GEO-ASTRO PHYSICS LAB
PRELIMINARY RESULTS OF PHASE QUADRATURE COMPONENTS OF MICROWAVE FORWARD SCATTERING FROM RANDOM WATER WAVES,
by C. E. Beard. Jun 65, 95p. Rept. no. D1-82-0440

Unclassified report

Also available from the author.

Descriptors: (*Electromagnetic wave reflections, Water waves), (*Water waves, Electromagnetic wave reflections), (*Microwaves, Propagation), Scattering, Radio waves, Radio fields, Phase measurement, Statistical analysis

A system is described for measuring the statistics of the phase quadrature components of the microwave field forward (or bistatically) scattered from random water waves. Information on the phase quadrature statistics of the incoherent scattered field is of aid to theoretical treatments and of application to over-water communication, radar, missile guidance, etc. Two types of simple random wave generators are described which produce approximately Gaussian water height fluctuations in the wave channel, which is 22 ft. long, 3.5 ft. wide, and 1.5 ft. deep.

AD-621 419 See Fld. 4/2

AD-621 457 Div. 8/6 ,25/3
CFSTI Prices: HC $2.00 MF $0.50
RAND CORP SANTA MONICA CALIF
WAVE PROPAGATION IN INHOMOGENEOUS ISOTROPIC HOT PLASMAS,
by H. Unz. Sep 65, 28p. Rept. no. P-3178-1

Unclassified report

Descriptors: (*Electromagnetic waves, Propagation), (*Plasma physics, Electromagnetic waves), Magnetohydrodynamics, Field theory, Temperature, Partial differential equations

The three dimensional wave equations for waves propagating in inhomogeneous, isotropic, hot compressible plasmas are derived from the macroscopic, linearized electro-magneto-plasma-gas-dynamics equations. Particular cases are discussed and compared with previous results. (Author)

AD-621 518 See Fld. 14/2

AD-621 559 See Fld. 20/4

AD-621 568 Div. 8/6 ,6/6
CFSTI Prices: HC $2.00 MF $0.50
LINCOLN LAB MASS INST OF TECH LEXINGTON
RADAR ECHO VARIATIONS OF A LARGE ROUGH SPHERE.
Technical note,
by M. L. Burrows. 14 Sep 65, 28p. Rept. no. TN-1965-46
Contract AF19 628 5167 Proj. 649L
ESD , TDR-65-443

Unclassified report

Descriptors: (*Radar echo areas, Spheres), Surface area, Surface property, Radar reflections, Configuration, Mathematical analysis, Electromagnetic wave reflections

The effect of surface roughness on the radar backscattering cross section of a perfectly conducting nominally spherical target is examined by applying the Kirchhoff method. It is shown that, for the type of roughness and sphere size to which the Kirchhoff method is applicable, the standard deviation of the cross section increases with frequency according to the law 2 square root of (2 sigma sub 0) K zeta until the first Fresnel zone reduces in size to the scale length of the roughness. At this point a knee in the curve occurs and its further course is determined by a more detailed statistical description of the surface. Here sigma sub 0 is the nominal cross section, zeta is the standard deviation of the surface height h and k = 2 lambda where lambda is the wavelength. Some experimental results are reported which support the theoretical conclusions and, moreover, indicate that they may be useful even when the scale length of the roughness is smaller than the wavelength. Further theoretical results are included concerning the effect of roughness on a general second order surface and the correlation function for the cross section. (Author)

21. PROPULSION AND FUELS

AD-620 856 Div. 12/4 ,25/3
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
METHOD OF OBTAINING A NEUTRALIZED ION BEAM FROM A PLASMA SOURCE WITH THE AID OF A HIGH FREQUENCY ELECTRIC FIELD,
by A. A. Kuzovnikov, and K. S. Golovanivskii.
19 Aug 65, 5p. Rept. no. FTD-TT-65-498
TT , 65-63876

Unclassified report

Unedited rough draft trans. of Russian patent 167 582, pub. 25 Feb 64, appl. 884780/26-25, 1p.

Descriptors: (*Plasma medium, Ion sources), (*Ion beams, Space propulsion), Ion engines, Electric fields, High frequency

A method is described of obtaining a neutralized ion beam from a plasma source with the aid of a high frequency electric field, characterized by the fact, that for the purpose of compensating the accumulated electrostatic charge of output from source and to assure its stable operation, the accelerating electrode is maintained under a high frequency and constant voltage relative to the plasma source. By selecting the frequency of the HF voltage is assured in each half-period the ejection, into outer space from the output opening of electron and positive ion clusters, the difference in e/m for electrons and ions is compensated and an average in time delivery of electric charge, equaling zero is obtained, by the arrangement of a corresponding voltage, fed from without or maintained automatically by assuring on the accelerating electrode of a floating potential. (Author)

AD-621 271 See Fld. 21/8

21/2. COMBUSTION AND IGNITION

AD-620 895 Div. 10/7 ,4/4 ,25/8
CFSTI Prices: HC $2.00 MF $0.50
UTAH UNIV SALT LAKE CITY INST FOR THE STUDY OF RATE PROCESSES
KINETICS AND THERMODYNAMICS OF COMBUSTION.
Final rept.,
by George Richard Hill. 30 Sep 56, 30p. Contract AF33 038 20839
AFOSR , TR-56-52

Unclassified report

Previously announced 13 Jun 58 as PB-126 413, LC mi$2.70, ph$4.80.

Descriptors: (*Combustion, Reaction kinetics), (*Thermochemistry, Combustion), Aldehydes, Oxidation, Free radicals, Hydrocarbons, Pyrolysis, Carbon, Films, Amines, Diboranes, Infrared spectroscopy, Polymerization, Coal

Contents: The experimental determination of free radical mechanisms in gas phase aldehyde oxidations, The thermal decomposition of hydrocarbons and related compounds, The thermal decomposition of hydrocarbons and related compounds, The kinetics of oxidation of carbon films, Kinetics of combustion of methylamine, Infra-red kinetic studies of diborane, The pyrolysis and polymerization mechanisms of large organic molecules.

AD-620 899 See Fld. 13/12

AD-621 199 Div. 10/7 ,4/4
TEXAS UNIV AUSTIN DEPT OF CHEMISTRY
SHOCK-TUBE STUDY OF THE HYDROGEN-OXYGEN REACTION,
by T. Asaba, W. C. Gardiner,Jr., and R. F.Stubbeman. 1964, 9p.
AROD , 3390:3

Unclassified report

Pub. in Symposium (International) on Combustion (10th) p295-302 1965 (Copies available only to DDC users). Prepared in cooperation with Esso Research and Engineering Co., Linden, N. J.

Descriptors: (*Hydrogen, Chemical reactions), (*Oxygen, Chemical reactions), (*Shock tubes, Chemical reactions), Ignition, Reaction kinetics, Chvmical reactions, Chemical bonds, Relaxation time

The hydrogen-oxygen reaction was investigated using OH absorption and emission measurements of induction times over the temperature range of 1400-2500K. The dependence of induction time on composition was studied to measure the relative influence of hydrogen and oxygen concentrations in determining the induction times. Comparison of experimental measurements with computed values obtained from an analytic solution to the rate equations, which is presented in detail, showed that the results could be understood in terms of rate-coefficient parameters which are in agreement with previous studies. The effect of slow vibrational relaxation of O2 was investigated under conditions where the vibrational relaxation times were comparable to the induction times. The results indicated that in normal studies of hydrogen-oxygen ignition kinetics no effect of slow vibrational relaxation will be observed. (Author)

AD-621 214 See Fld. 20/4

AD-621 216 See Fld. 7/4

AD-621 496 Div. 10/7 ,25/7
GENERAL DYNAMICS/ASTRONAUTICS SAN DIEGO CALIF SPACE SCIENCE LAB
A BAND-RATIO TECHNIQUE FOR DETERMINING TEMPERATURES AND CONCENTRATIONS OF HOT COMBUSTION GASES FROM INFRARED-EMISSION SPECTRA,
by C. C. Ferriso, C. B. Ludwig, and F. P. Boynton. 1965, 15p.

Unclassified report

Pub. in Symposium (International) on Combustion (10th), p161-75 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Combustion products, Infrared spectroscopy), (*Infrared spectroscopy, Band spectrum), Temperature, Gases, Water, Carbon dioxide, Emissivity, Molecular spectroscopy

An infrared-band-ratio technique (BRT) was developed by which infrared emission spectra from various bands of H2O and CO2 in the 1-micron to 3.5-micron spectral region are used to determine the temperature and concentration ratio (CO2)/(H2O) of hot gases. BRT is based on the observation that the integrated intensities of various H2O and CO2 bands are temperature dependent and that emission in the 2.7-micron spectral region is due to both H2O and CO2. Although BRT is applicable to any molecule, the working curves obtained only for H2O and CO2, as an example of the method. The original technique is extended

to include emission from a continuum source; moreover, working curves are given for small carbon particles in the hot-gas sample. The carbon work is based on a specific model for the absorption coefficient as a function of temperature and wavelength. The technique was applied to hotgas systems, where the temperatures and concentrations are known from an independent experiment, and the agreement with those values found by BRT is very good. (Author)

AD-621 506 See Fld. 21/9

21/4. FUELS

AD-620 809 See Fld. 13/1

AD-621 531 Div. 10/2
CFSTI Prices: HC $4.00 MF $0.75
PHILLIPS PETROLEUM CO BARTLESVILLE OKLA
THERMAL STABILITY OF HYDROCARBON FUELS.
Technical documentary rept. for 1 Jun 64-31 May 65,
by Lucien Bagnetto. 15 Aug 65, 124p. Contract AF33 657 10639 Proj. 3048 Task 304801
APL , TDR-64-89 P2

Unclassified report

Descriptors: (*Storage, Jet engine fuels), (*Jet engine fuels, Stability), (*Temperature, Fuel tanks), Hydrocarbons, Oxygen, Solutions, Colorimeters, Furnaces, Test methods, Contamination, Thermal properties

A program to investigate the effect of storage time and temperature on changes in thermal stability quality as measured by the CRC-Modified Fuel Coker (Supersonic Fuel or SSF) for five widely different fuel types revealed no significant deterioration of any fuels after 36 weeks at ambient field condition or 22 weeks at 130F. After storage up to 36 days at 180F four fuels showed no loss in thermal stability, but an HF alkylate fuel, containing about 2 per cent olefins, showed a significant loss after only 6 days at 180F. Removal of dissolved oxygen (to less than one part per million) from the HF alkylate fuel prior to storage prevented deterioration. Phillips' small scale (5-ml Bomb) procedure, developed to measure changes in fuel thermal stability quality, was found to correlate satisfactorily with the ASTM-CRC (Standard) Fuel Coker for ASTM Type-A distillate fuels. The amount of dissolved oxygen in fuels has been found to affect, significantly, thermal stability quality as measured by the 5-ml Bomb and the Fuel Cokers. Removal of dissolved oxygen from fuels of low and average thermal stability invariably resulted in gross improvements. Only slight improvements were found after removing dissolved oxygen from fuels of very high thermal stability quality. (Author)

21/5. JET AND GAS TURBINE ENGINES

AD-620 862 Div. 27/2
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
HEAT TRANSFER OF A TURBINE ROTOR WITH RADIAL FLOW OF COOLING MEDIUM,
by V. M. Kapinos. 9 Aug 65, 17p. Rept. no. FTD-TT-65-957
TT , 65-63872

Unclassified report

Unedited rough draft trans. of InzhenernoFizicheskii Zhurnal (USSR) v7 n1 p3-11 1964.

Descriptors: (*Gas turbine rotors, Heat transfer), (*Heat transfer, Gas turbine rotors), Coolants, Mathematical analysis, USSR, Heat exchangers, Boundary layer, Heat transfer coefficients

Heat exchange of a rotor with arbitrary distribution of temperature along the radius is studied. Criterional formulas for determining the coefficients of heat exchange at end surfaces of disc or drum rotors are proposed which are based on an approximate theoretical solution of the problem considered and of experimental data. (Author)

AD-620 951 See Fld. 9/5

AD-621 578 See Fld. 1/3

21/6. NUCLEAR PROPULSION

AD-621 021 See Fld. 18/9

21/7. RECIPROCATING ENGINES

AD-620 951 See Fld. 9/5

AD-620 974 Div. 27/1 ,1/4
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
RESOURCE INCREASED IN DOUBLE,
by M. Galperin, G. Ushakov, and G. Vasilchenko. 26 Aug 65, 11p. Rept. no. FTD-TT-65-723
TT , 65-63915

Unclassified report

Unedited rough draft trans. of Grazhdanskaya Aviatsiya (USSR) v21 n8 p28-9 1964.

Descriptors: (*Aircraft engines, Performance (Engineering)), USSR, Pistons, Lubrication, Gas flow, Loading (Mechanics), Connecting rods, Maintenance, Life expectancy

The general service life and time before first repair of piston type aircraft engines was almost doubled by improving the air flow of the cylinder, reducing cylinder temperature, improving lubrication and reducing load on pistons of main connecting rods.

21/8. ROCKET MOTORS AND ENGINES

AD-620 851 See Fld. 20/8

AD-620 983 Div. 27/3 ,25/8
CFSTI Prices: HC $3.00 MF $0.75
NAVAL ORDNANCE TEST STATION CHINA LAKE CALIF
TRANSPIRATION COOLING WITH LIQUID METALS. PART I. EXPERIMENTAL AND ANALYTICAL DETERMINATION OF OPTIMUM COOLING,
by Milton R. Wolfson, Allen T. Robinson, and William H. Thielbahr. Jun 65, 99p. Rept. no. NOTS-TP-3790
Task RMMP23 082 216 1F009 06 03
NAVWEPS , 8732 P1

Unclassified report

Descriptors: (*Rocket motor nozzles, Cooling), (*Liquid metal coolants, Impregnation), (*Porous metals, Impregnation), Refractory materials, Tungsten, Permeability, Heat transfer, Silver, Copper, Tin, Boundary layer, Vaporization, Transition temperature

An analytical and experimental program was conducted to evaluate a forced flow transpiration cooling system. A two-dimensional heat transfer program was applied to define the individual contributing cooling mechanisms associated with transpiration (i.e., boundary layer three tests were performed on porous tungsten bodies with various infiltrants in a plasma-arc facility. Analytical results were correlated with experimental data. Material and design values were identified for the fabrication of an efficient transpiration cooled structure. (Author)

AD-621 016 See Fld. 14/2

AD-621 019 See Fld. 14/2

AD-621 271 Div. 27/3 ,12/4
CFSTI Prices: HC $1.00 MF $0.50
ORDNANCE AEROPHYSICS LAB GENERAL DYNAMICS|DAINGERFIELD TEX
TESTS OF THE SATURN C-5, S-II ULLAGE MOTORS (RS-U-501) UNDER ALTITUDE ENVIRONMENT IN THE BLOWDOWN FACILITY, FOR THE SOLID ROCKET DIVISION, ROCKETDYNE, OF NORTH AMERICAN AVIATION, INC.,
by E. L. Colthurst. 9 Sep 65, 3p. Rept. no. OAL-706
Contract NOw63 0405

Unclassified report

Descriptors: (*Rocket motors (Solid propellant), Captive test), Simulation, High altitude, Performance (Engineering), Thrust, Pressure

Altitude static firing tests of the Saturn C-5, S-II Ullage rocket motors (RS-U-501) were performed. The tests were the first altitude test firings of the Ullage motor. The objective was to evaluate the ballistic performance at design altitude. The two rocket motors were tested successfully. RT 010-D, conditioned to 20F, was fired at a simulated altitude of approximately 146.5 K feet. The sustained altitude during burning was approximately 141 K feet. RT 011-D, conditioned to 125F, was fired at a simulated altitude of approximately 153 K feet. The sustained altitude during burning was approximately 145.8 K feet. (Author)

AD-621 366 Div. 27/3 ,10/5
CFSTI Prices: HC $3.00 MF $0.75
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
INTRODUCTION TO ROCKET TECHNIQUE,
by V. I. Feodosev, and G. B. Sinyarev. 1959, 97p. Rept. no. F-TS-9440/V
TT , 59-19501

Unclassified report

Trans. of mono. Vvedenie v Raketnuyu Tekhniku, Moscow, 1956 p100-73.

Descriptors: (*Rocket propulsion, Rocket motors), (*Rocket propellants, Combustion), (*Combustion, Rocket propellants), Liquid rocket fuels, Combustion products, Rocket motors (Liquid propellant), Pyrolysis, Dissociation, Nuclear propulsion, USSR

The fuel of rocket engines: chemical energy of rocketengine fuels, modern fuels for liquid-fuel and powder rocket engines, the energy of nuclear reactions and its utilization in rocket engines. Processes in the combustion chamber of a rocket engine: combustion in the liquid-fuel rocket engine, burning of rocket powders, combustion products and their properties, thermal dissociation and composition of the combustion products.

AD-621 387 Div. 27/3
CALIFORNIA UNIV LOS ANGELES
THE OPTIMUM OPERATION OF ENERGYRESTRICTED ROCKETS, INCLUDING RELATIVISTIC EFFECTS,
by Nicholas Rott, and J. Ackeret. 1960, 2p.

Unclassified report

Pub. in Schweizerische Bauzeitung v81 n11 p1-2 Mar 14 1963 (Copies available only to DDC users).

Descriptors: (*Rocket propulsion, Optimization), Rocket propellants, Burning rate, Exhaust gases, Velocity, Controllable-thrust rocket motors, Relativity theory

If the total energy available for the propulsion of a rocket is restriced while the exhaust velocity

may be varied, it has been shown that the rocket performance can be improved by certain 'taylor-ing' of the exhaust speed. This concept is discussed in terms of relativistic mechanics.

AD-621 466 Div. 27/3 ,25/3
ILLINOIS UNIV URBANA
INVESTIGATION OF THE CHARGE-TO-MASS RATIO OF ELECTRICALLY SPRAYED LIQUID PARTICLES,
by J. J. Hogan, and C. D. Hendricks. 1 May 64, 8p. Contract AF AFOSR107 64 Proj. 9752 Task 975201
AFOSR , 65-1428

Unclassified report

Pub. in AIAA Journal v3 n2 p296-301 Feb 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Electric propulsion, Sprays), (*Charged particles, Particle size), (*Atomization, Charged particles), Aerosols, Space propulsion, Electrostatics, Space charges, Electrical conductance, Evaporation, Capillary tubes, Voltage, Thiols

An analysis of the charge-to-mass ratios (specific charges) of particles generated by the electrical atomization process is presented. The study involves the surface energy of the dispersed system of particles, the effects of space charge on the source, and the effects of conductivity on the atomization process. Experimental data are presented in support of these theories. Further, a colloidal suspension in glycerine is experimentally shown to produce particles of high specific charge (400 coul/kg) when electrically dispersed under appropriate conditions. (Author)

21/9.1 LIQUID ROCKET PROPELLANTS

AD-620 940 **See Fld. 13/12**

AD-621 236 **See Fld. 7/4**

AD-621 366 **See Fld. 21/8**

AD-621 506 Div. 10/5 ,10/7 ,4/4
PRINCETON UNIV N J
THE GAS-PHASE DECOMPOSITION OF HYDRAZINE AND ITS METHYL DERIVATIVES,
by Igor J. Eberstein, and Irvin Glassman. 1965, 12p. Contract AF AFOSR62 90 ,NSF GP579

Unclassified report

Pub. in Symposium (International) on Combustion (10th), Pittsburgh, Pa. p365-74 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Hydrazine, Decomposition), (*Dimethyl hydrizine (1-1), Decomposition), (*Methyl hydrazines, Decomposition), (*Monopropellants, Decomposition), Water vapor, Reaction kinetics, Gases, Chemical reactions, Combustion

The decomposition of hydrazine, hydrazine-water mixtures, UDMH, and monomethyl-hydrazine was studied in the Princeton adiabatic flow reactor. The over-all reaction order of all three monopropellants was very close to unity. A study of hydrazine-water mixtures showed their rates to be slower than those of the anhydrous material by approximately a factor of 10 and independent of the amount of water added. Slightly wet hydrazine behaved kinetically like the hydrazine-water mixtures. Thus it seems that water inhibits the gaseous decomposition of hydrazine by very effectively suppressing some reaction step. A comparison of the reaction rates of the three monopropellants shows that, in the temperature regime of this study, UDMH decomposition is the fastest, hydrazine decomposition is the slowest, and the monomethylhydrazine-decomposition rate is intermediate.

21/9.2 SOLID ROCKET PROPELLANTS

AD-620 847 **See Fld. 5/1**

22. SPACE TECHNOLOGY

AD-620 834 Div. 12/6 ,12/1 ,15/1
CFSTI Prices: HC $3.00 MF $0.75
RAND CORP SANTA MONICA CALIF
AN APPROXIMATE SOLUTION TO THE RELATIVE MOTION OF TWO CLOSE SATELLITES IN THE PRESENCE OF DRAG AND OBLATENESS,
by H. B. Schechter, and J. D. Cole. Aug 65, 60p. Rept. no. RM-4481-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Satellites (Artificial), Motion), (*Numerical analysis, Orbital trajectories), Drag, Aerodynamic characteristics, Relativity theory, Perturbation theory

This memorandum is concerned with the relative motion of two satellites under the influence of air drag and the J term in the earth's potential. An exponential atmosphere is assumed, and a linear fit is shown to be satisfactory for changes in altitude of up to about 40 percent of the scale height. The motion is referred to a coordinate system attached to an infinitely heavy satellite moving along a circular orbit at an altitude of 100 n mi. The first-order effects of drag and oblateness are obtained, using a two-time variable-expansion procedure proposed by Kevorkian (The two variable expansion procedures for the approximate solution of certain non-linear differential equations, Douglas Aircraft Co., Douglas report SM-42620 Dec. 3, 1962). The two satellites are assumed to start out from the same point on the circular orbit, but with a tangential velocity difference of not more than about 10 ft/sec. Simple algebraic expressions are obtained which provide a quick and fairly accurate way to determine the separation distance at the end of n orbits. (Author)

AD-620 866 Div. 12/6 ,12/1 ,25/6
CFSTI Prices: HC $2.00 MF $0.50
ASTROMECHANICS RESEARCH DIV GIANNINI CONTROLS CORP MALVERN PA
EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF ELASTICITY ON THE STABILITY OF MANNED ROTATING SPACE STATIONS.
Technical rept.,
by Jacob M. Miller, and Frank J. Frueh. Jun 65, 33p. Contract AF49 638 1015
AFOSR , 65-104

Unclassified report

Descriptors: (*Space stations, Stability), (*Manned spacecraft, Stability), Elasticity, Rotation, Dynamics, Structural properties, Configuration, Vibration, Mathematical analysis, Experimental data, Model tests

The report presents the results and conclusions obtained from an experimental program investigating the structural dynamic stability of an elastic model of a manned rotating space station. Stability criteria for this aerospace configuration were theoretically derived and model tests were performed to substantiate these stability criteria and to demonstrate that an elastic instability of such configurations is possible. (Author)

AD-620 876 Div. 12/6 ,19/6
CFSTI Prices: HC $4.00 MF $0.75
RAND CORP SANTA MONICA CALIF
COMPUTER PROGRAM FOR OPTIMUM LOW-THRUST ORBIT TRANSFERS,
by J. A. Jolissaint. Sep 65, 120p. Rept. no. RM-4704-PR
Contract AF49 638 700

Unclassified report

Descriptors: (*Transfer trajectories, Thrust), (*Programming (Computers), Transfer trajectories), Optimization, Spacecraft, Rendezvous trajectories, Satellites (Artificial)

The memorandum describes a digital computer program written in FORTRAN IV, which simulates mathematically a multi-stage low-thrust orbit transfer process. The process provides a means of transferring a space vehicle from some initial orbit to a desired terminal orbit along an optimum path with respect to some quadratic performance criteria. The program was generalized to enable it to handle such problems as orbit correction of a 24-hour communication satellite, transfer of a vehicle from an orbit around earth to one around a neighboring planet, or rendezvous of a space vehicle with an earth satellite. The memorandum may serve as a reference manual for those desiring to use the program, and it was organized so that the user can acquaint himself with the program to any degree desired. After a general description of the program, its capabilities and limitations, and a complete set of instructions concerning its use, two numerical examples are given. This material should provide sufficient detail for anyone desiring to use the program in its present form. For those wishing to modify or examine the substance of the program, a complete description of each routine including equations and flow charts is given. (Author)

AD-620 883 Div. 12/6 ,30/5
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
THE SPACE PROGRAMS OF THE SOVIET UNION,
by F. J. Krieger. Aug 65, 12p. Rept. no. P-3204

Unclassified report

Prepared for presentation at the American Astronautical Society's national meeting at San Francisco, Calif., 18-20 Aug 65.

Descriptors: (*Space flight, USSR), Reviews, Spacecraft, Trajectories

AD-620 926 Div. 12/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
CONSTANTS THAT AREN'T CONSTANT, AND THEIR EFFECTS ON SIMPLE ORBIT CALCULATIONS,
by G. M. Northrop. Sep 65, 13p. Rept. no. P-3225

Unclassified report

Descriptors: (*Orbital trajectories, Determination), (*Data, Physical properties), Earth, Gravity, Analysis of variance

The discussion is intended to illustrate some of the difficulties the ordinary researcher is apt to encounter as a result of imprecise knowledge of astronomical and laboratory units of measurement. Variations in gravitational constants of the earth and of the diameter of the earth are given. The author concludes: Beware of constants; chances are they aren't.

AD-620 975 Div. 12/6 ,12/1
CFSTI Prices: HC $1.00 MF $0.50
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
THE FREEWAY FROM OUTER SPACE,
by A. Shibanov, and F. Borisova. 24 Jun 65, 10p. Rept. no. FTD-TT-65-741
TT , 65-63916

Unclassified report

Unedited rough draft trans. of Tekhnika Molodezhi (USSR) v 31 n9 p3-4 1963.

Descriptors: (*Space environmental conditions, Space flight), Atmosphere, Meteorites, Trajectories, USSR, Astronautics, Reentry vehicles

A popularized account is given of atmospheric factors to be considered in space flight.

AD-620 979 Div. 12/6 ,12/1 ,19/4
LINCOLN LAB MASS INST OF TECH LEXINGTON
EXPERIMENT IN SOLAR ORIENTATION OF SPIN STABILIZED SATELLITE,
by M. C. Crocker,II, and E. A. Vrablik. 25 Feb 65, 2p.

Unclassified report

Pub. in AIAA Journal p1350-1 July 1965 (Copies not available to DDC or Clearinghouse customers).

Descriptors: (*Satellites (Artificial), Magnetic guidance), (*Magnetic guidance, Satellites (Artificial)), Spin, Stabilization systems, Magnetic moments, Moment of inertia, Terrestrial magnetism, Magnetic navigation, Torque, Servomechanisms, Celestial navigation, Celestial mechanics, Communication satellites (Active), Astronautics

In order to equalize the satellite skin temperatures and increase solar cell efficiency, an attempt is made to precess the satellite's spin vector perpendicular to the solar vector and maintain it in that position, using a magnetic torquing system that requires no commands from the ground. The advantage of this orientation to a high area thermal-mass ratio satellite with no batteries aboard is a temperature balance more favorable to power conversion. The orientation is to be accomplished by controlling the magnitude and direction of the satellite's magnetic moment, which will be aligned with the largest principal moment of inertial (approx 1.5 kg - sq m) of the satellite (coincident with the spin axis). This magnetic moment will interact with the earth's geomagnetic field to produce a controlled orientation torque. (Author)

AD-621 189 Div. 12/6 ,12/1
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y
MINIMUM IMPULSE COPLANAR CIRCLE-ELLIPSE TRANSFER.
Revised ed.,
by H. Gardner Moyer. 20 Jan 65, 6p. Contract AF49 638 1207 Proj. 9749 Task 974901
AFOSR , 65-1360

Unclassified report

Pub. in AIAA Journal v3 n4 p723-6 Apr 1965 (Copies not available to DDC or Clearinghouse customers). Revision of manuscript dated 6 Jul 64.

Descriptors: (*Transfer trajectories, Calculus of variations), (*Calculus of variations, Transfer trajectories), Orbital trajectories

This report explores a technique devised by Contensou and Breakwell for the generation of optimal N-impulse coplanar orbit transfers. In this procedure, the problem is transformed so that the calculus of variations can be employed. Applying the technique to circle-ellipse transfer it is found that the properties of the solution family are derived in a straightforward, rigorous, and global manner, in sharp contrast with the earlier derivations. The extremal solutions fall into two classes: those that correspond to Hohmann-type transfers and those that correspond to three-point transfers with the middle point at an infinite distance from the center of attraction. For some final orbits, both classes provide candidates for the absolute minimum, and the better transfer can come from either class. For the other final orbits, only extremals that correspond to the three-point transfer exist. (Author)

AD-621 325 Div. 12/6 ,12/1 ,32/9 ,5/4 ,+
CFSTI Prices: HC $1.00 MF $0.50
RAND CORP SANTA MONICA CALIF
RESEARCH ON SOCIAL CONSEQUENCES OF SPACE ACTIVITIES,
by Joseph M. Goldsen. Aug 65, 10p. Rept. no. P-3220

Unclassified report

Prepared for presentation at the American Astronautical Society National Meeting on The Impact of Space Exploration on Society, San Francisco, Calif., 18 Aug 65.

Descriptors: (*Space flight, Social sciences), (*Communication satellites (Active), Commerce), Communication satellites (Passive), Economics, Scientific research, Radio communication systems

The argument is made that there needs to be comprehensive study of the social and economic implications of explorations into space. These include international political and legal complications and those arising from possibilites of utilizing communication satellites. The belief is expressed that the national space agencies and major contractors should study their own operations and the economic and social implications of their products; they should learn to mobilize techniques of organization and achievement to the nonspace needs of human environment.

AD-621 380 Div. 12/6 ,12/1 ,29/5
CFSTI Prices: HC $2.00 MF $0.50
LOCKHEED-CALIFORNIA CO BURBANK
PERSONAL PROPULSION SYSTEM.
Final rept. for Jun-Dec 64,
by G. E. Hanff, R. H. Moulton, and R. E. Geller. Jul 65, 33p. Contract AF33 615 1903 Proj. 7184 Task 718405
AMRL . TR-65-89

Unclassified report

Descriptors: (*Propulsion, Astronauts), (*Astronauts, Maneuverability), Space environmental conditions, Valves, Nozzles, Pneumatic devices, Tests, Calibration, Pressure regulations, Gas cylinders

The report describes a laboratory model of a simple manually controlled, tractor type, personnel propulsion unit for use under zero gravity conditions. The device consists of a pair of hand-mounted thrust nozzles with fore and aft thrust vector control. A backpack containing two, high pressure, gas bottles supplies dry nitrogen to the thrusters. A series of tests were conducted to obtain thrust nozzle calibration, valve/nozzle modulation, and verification of the total system to deliver the required thrust. The tests verified that the thrust nozzles were within tolerance. The valve/nozzle combination demonstrated total system performance within specification requirements and with satisfactory modulation characteristics. Further research should include evaluation of the propulsion system in a zero gravity environment. (Author)

AD-621 584 Div. 12/6 ,12/1 ,30/2 ,12/1
CFSTI Prices: HC $2.00 MF $0.75
ARMY MISSILE COMMAND REDSTONE ARSENAL ALA
SOME EARTH-TO-MOON FLIGHT PATHS AS SIMULATED BY ANALOG COMPUTER,
by Warren H. Straly, and Harry O. Ruppe. 1 Jul 58, 43p. Rept. no. DSP-TN-2-58

Unclassified report

Available copy will not permit fully legible reproduction. Reproduction will be made if requested by users of DDC. Copy is available for public sale.

Descriptors: (*Lunar trajectories, Simulation), (*Analog computers, Astronautics), (*Astronautics, Analog computers), Lunar probes, Data processing systems, Reviews

This report gives moon-flight-path trajectories as computed by the analog computer. This work on lunar probes and the trajectories is being carried out in a series of reports. This report is a third of that series; previous reports being: ABMA, Report No. DS-TN-170, 27 February 1958, 'A Survey of the Lunar Project' by Harry K. Ruppe; ABMA, Report No. DSP-TM-3-58, 30 May 1958, 'Derivation and Calculation of Initial MoonHitting Trajectories', by Harry O. Ruppe and Warren H. Straly. The results of this analog survey show that the analog computer is of great value because of its rapidity and flexibility. The accuracy is sufficient for this type survey and the task of reading the plotted trajectories is small when compared to a sheet of digital numbers. (Author)

How To Use Indexes To TAB Portion Of

U. S. GOVERNMENT RESEARCH AND DEVELOPMENT REPORTS

SUBJECT INDEX

The Subject Index is arranged alphabetically by asterisked descriptors from the document announcements in the TAB. Each announcement contains one or more asterisked descriptors which identify the main subjects of the report. The asterisked descriptor may or may not have a modifying descriptor appearing directly below the asterisked descriptor. Under each descriptor entry in the Subject Index appear the following items of information: annotation, AD number, and field/group. A typical subject index entry is shown below.

*ALUMINUM
GLASS TEXTILES
INVESTIGATION OF GLASS-
METAL COMPOSITE MATERIALS
AD-619 773 FLD. 11/7

PERSONAL AUTHOR INDEX

The Personal Author Index is arranged alphabetically by the last names of the authors of reports. When several report entries are given for one author, the entries are arranged numerically by AD number. Field/group and titles are also listed. Three asterisks serve as a separator between entries for reports under the same author. A typical personal author entry is shown below.

*CHASE, JOHN W.
* * *
THE LANTHANUM, EUROPIUM,
AND DYSPROSIUM CONTENTS OF
TWO TEKTITES
AD-619 828 FLD. 8/7
* * *
A PROCEDURE FOR GEOCHEMICAL
INTERPRETATION OF TERRESTRIAL
RARE-EARTH ABUNDANCE PATTERNS
AD-619 834 FLD. 8/7

CORPORATE AUTHOR-MONITORING AGENCY INDEX

The Corporate Author-Monitoring Agency Index is arranged alphabetically by corporate authors and monitoring agencies.

In the corporate author entry for each document are listed the originator of the report, the originator's report number, the title, AD number, and field/group. If the source has listed a monitoring agency in the report, the monitor acronym and monitor series number are given in parenthesis directly under the title. An IDEP (Interservice Data Exchange Program) report number is presented in the same way. A typical corporate author entry is shown on the next page.

*AEROJET- GENERAL CORP AZUSA
CALIF

* * *

TR3015
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
(AFOSR 65-1058)
AD-619 513 FLD. 7/4

The three asterisks serve as a separator between entries for reports under the same corporate author.

When a report lists a monitoring agency, a corresponding entry is provided under the name of the monitoring agency, which appears in alphabetical order among the corporate author entries. In a monitoring agency entry, the report number is given above the title in place of the originator's report number. A typical monitoring agency entry is shown below.

*AIR FORCE OFFICE OF SCIENTIFIC
RESEARCH WASHINGTON D C

* * *

65-1058
STUDY OF THE REACTION
OF PENTABORANE WITH HYDRAZINE
AND SUBSTITUTED HYDRAZINES
AD-619 513 FLD. 7/4

CONTRACT INDEX

The Contract index is arranged alphanumerically by contract number. Within a contract grouping, each entry contains corporate author, series number (if any), monitor number (if any), AD number, and field/group.

When there are multiple document entries under one contract number, entries are arranged by AD number under each corporate author represented.

A contract entry may also contain a letter F, A, or S on the left-hand margin, indicating that the document is a Final, Annual, or Summary report. A typical contract entry is shown below.

*AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-65-315)
AD-619 580 FLD. 9/5
(ESD TDR-65-309)
AD-619 708 FLD. 3/1

AD-FIELD INDEX

The AD-Field Index is arranged numerically by AD number and lists the field/group where the full entry can be located in TAB.

SUBJECT INDEX

The fields/groups indicated here apply only to the Technical Abstract Bulletin Section (on white paper)

•ACETYLCHOLINE
AORTA
STUDY OF DRUG RECEPTORS IN THE ISOLATED RABBIT AORTA STRIP.
AD-621 909 FLD.6/15

•ACID-BASE REACTIONS
HYDROGEN PEROXIDE
REPRINT: ACID-BASE PROPERTIES OF HYDROGEN PEROXIDE-WATER MIXTURES.
AD-621 236 FLD.7/4

•ACOUSTIC EQUIPMENT
SEMICONDUCTOR DEVICES
ACTIVE ACOUSTIC DEVICES.
AD-620 899 FLD.9/1

•ACOUSTICS
CAVITATION
REPRINT: RECTIFIED DIFFUSION DURING NONLINEAR PULSATIONS OF CAVITATION BUBBLES.
AD-621 961 FLD.20/9

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METHODS FOR APPLYING MEASURED DATA TO VIBRATION AND ACOUSTIC PROBLEMS.
AD-620 988 FLD.1/3

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AD-621 372 FLD.17/2

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AD-621 129 FLD.20/1

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AD-620 820 FLD.11/1

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AD-621 327 FLD.5/10

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'THE QUEST FOR SELF-CONTROL: CLASSICAL PHILOSOPHIES AND SCIENTIFIC RESEARCH,' EDITED BY SAMUEL Z. KLAUSNER: SYMPOSIUM ON SELF CONTROL OF THE HUMAN BEING.
AD-621 135 FLD.5/10

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AD-621 324 FLD.9/2

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AD-621 519 FLD.19/4

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AD-621 247 FLD.19/4

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AD-621 146 FLD.20/4

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AD-621 929 FLD.20/4

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•AEROELASTICITY
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AD-621 969 FLD.18/8

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GAS DETECTORS
REACTIVE LIQUID CRYSTAL MATERIALS FOR THE DETECTION OF NOXIOUS GASES AND VAPORS.
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AD-621 393 FLD.20/4
EXPERIMENTAL AND ANALYTICAL INVESTIGATION OF HYPERSONIC INLET BOUNDARY LAYERS. DATA REDUCTION PROGRAM AND TABULATED EXPERIMENTAL DATA.
AD-621 394 FLD.20/4

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MATHEMATICAL MODELS OF THE MOTIONS OF AN AIRCRAFT CARRIER AT SEA.
AD-620 869 FLD.13/10

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REPRINT: EFFECT OF PRESSURE AND TEMPERATURE ON THE RATE OF THE ACID-CATALYZED HYDRATION OF ETHYLENE.
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AD-621 403 FLD.6/1

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AD-621 058 FLD.12/1

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AD-621 536 FLD.12/1

THEORY
REPRINT: HOMOLOGY THEORY FOR LOCALLY COMPACT SPACES.
AD-621 412 FLD.12/1

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AD-621 130 FLD.20/12

IONIZATION
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AD-620 939 FLD.7/4

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BATTERY SEPARATORS
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AD-621 472 FLD.7/3

REACTION KINETICS
REPRINT: EFFECT OF PRESSURE AND TEMPERATURE ON THE RATE OF THE ACID-CATALYZED HYDRATION OF ETHYLENE.
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BIOASSAY OF THE PROMINENT HUMORAL AGENTS INVOLVED IN ENDOTOXIN SHOCK.
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REPRINT: METALLURGICAL APPLICATIONS OF FLAME SPECTROPHOTOMETRY.
AD-621 382 FLD.11/6

•ALL-WEATHER AVIATION
WEATHER FORECASTING
FLIGHT DATA ANALYSIS OF THE RELATIONSHIP BETWEEN ATMOSPHERIC TEMPERATURE CHANGE AND CLEAR AIR TURBULENCE.
AD-620 989 FLD.4/2

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METALLURGICAL CHARACTERISTICS OF HIGH STRENGTH STRUCTURAL MATERIALS.
AD-621 567 FLD.11/6

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TRANSLATION OF RUSSIAN RESEARCH. BUILDING STRUCTURES FROM ALUMINUM ALLOYS (COLLECTION OF ARTICLES).
AD-620 816 FLD.13/13

•ALUMINUM COMPOUNDS
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STRATHCLYDE UNIV GLASGOW
(SCOTLAND) DEPT OF MATHEMATICS
(AFOSR 69-1362)
AD-621 284 FLD.20/4

•AF AFOSR222 69
TORONTO UNIV (ONTARIO) INST
FOR AEROSPACE STUDIES
AD-621 996 FLD.20/4

•AF AFOSR229 62
JOHN CARROLL UNIV CLEVELAND
OHIO DEPT OF PHYSICS
(AFOSR 69-1983)
F AD-621 130 FLD.20/12

•AF AFOSR228 63
PURDUE UNIV LAFAYETTE IND
DEPT OF CHEMISTRY
(AFOSR 69-1442)
F AD-621 131 FLD.7/3

•AF AFOSR24 65
NEW YORK UNIV N Y LAB FOR
ELECTROSCIENCE RESEARCH
(AFOSR 69-1995)
AD-621 086 FLD.9/2

•AF AFOSR246 63
CALIFORNIA UNIV LOS ANGELES
SCHOOL OF MEDICINE
AD-621 937 FLD.6/16

•AF AFOSR260 63
BATTELLE MEMORIAL INST COLUMBUS
OHIO
(AFOSR 69-1372)
AD-621 907 FLD.20/3

•AF AFOSR266 62
COURANT INST OF MATHEMATICAL
SCIENCES NEW YORK UNIV
N Y
(AFOSR 69-1397)
AD-621 971 FLD.20/13

•AF AFOSR302 63
SYDNEY UNIV (AUSTRALIA)
(AFOSR 69-1119)
AD-620 963 FLD.3/1

•AF AFOSR33 69
SOUTHWEST RESEARCH INST SAN
ANTONIO TEX
(AFOSR 69-0728)
AD-621 209 FLD.9/2

•AF AFOSR341 63
MASSACHUSETTS INST OF TECH
CAMBRIDGE
(AFOSR 69-1279)
AD-621 201 FLD.12/1

•AF AFOSR369 63
TORONTO UNIV (ONTARIO) INST
FOR AEROSPACE STUDIES
(AFOSR 69-1900)
AD-621 997 FLD.14/2

•AF AFOSR376 63
KANSAS UNIV LAWRENCE DEPT
OF CHEMISTRY
AD-621 262 FLD.7/4

•AF AFOSR416 64A
CINCINNATI UNIV OHIO DEPT
OF AEROSPACE ENGINEERING
(AFOSR 69-0849)
AD-621 985 FLD.20/4

•AF AFOSR420 63
EIDGENOESSISCHE TECHNISCHE
HOCHSCHULE ZURICH (SWITZERLAND)
AD-620 886 FLD.20/12

•AF AFOSR445 63
CATHOLIC UNIV OF AMERICA
WASHINGTON D C
(AFOSR 69-1118)
AD-620 831 FLD.20/3

•AF AFOSR488 63
CALIFORNIA INST OF TECH PASADENA
(AFOSR 69-1226)
F AD-621 280 FLD.6/3

•AF AFOSR460 63
ILLINOIS UNIV URBANA
(AFOSR 69-1411)
AD-621 258 FLD.12/1
(AFOSR 69-1413)
AD-621 259 FLD.12/1

•AF AFOSR472 69
OHIO STATE UNIV COLUMBUS
(AFOSR 69-1714)
AD-621 192 FLD.9/10

•AF AFOSR480 69
MELLON INST PITTSBURGH PA
(AFOSR 69-1133)
AD-621 316 FLD.7/3

•AF AFOSR482 69
CHICAGO UNIV ILL
(AFOSR 69-1162)
AD-621 969 FLD.9/11

•AF AFOSR6 69
STRATHCLYDE UNIV GLASGOW
(SCOTLAND) DEPT OF MATHEMATICS
(AFOSR 69-1362)
AD-621 284 FLD.20/4

•AF AFOSR612 69
CALIFORNIA UNIV LOS ANGELES
(AFOSR 69-1387)
AD-621 160 FLD.9/7

•AF AFOSR62 108
NEW YORK UNIV N Y
(AFOSR 69-1407)
AD-621 562 FLD.12/1

•AF AFOSR62 160
GEORGETOWN UNIV WASHINGTON
D C DEPT OF PHYSICS
(AFOSR 69-1390)
AD-621 244 FLD.7/4

•AF AFOSR62 190
FLORIDA STATE UNIV TALLAHASSEE
(AFOSR 69-1286)
AD-621 285 FLD.6/1

•AF AFOSR62 237
TEXAS UNIV AUSTIN DEPT OF
CHEMICAL ENGINEERING
(AFOSR 69-1384)
AD-621 261 FLD.20/12

•AF AFOSR62 289
ARIZONA UNIV TUCSON
(AFOSR 69-1169)
AD-621 384 FLD.9/4

•AF AFOSR62 307
NORTHWESTERN UNIV EVANSTON
ILL GAS DYNAMICS LAB
(AFOSR 69-1338)
AD-621 213 FLD.20/3

•AF AFOSR62 407
MASSACHUSETTS INST OF TECH
CAMBRIDGE AEROPHYSICS LAB
(AFOSR 69-1149)
AD-621 525 FLD.20/4

•AF AFOSR62 482
INSTITUTE OF THEORETICAL PHYSICS
STANFORD UNIV CALIF
(AFOSR 69-1396)
AD-621 249 FLD.20/8
STANFORD UNIV CALIF DEPT
OF PHYSICS
(AFOSR 69-1395)
AD-621 251 FLD.20/8

•AF AFOSR62 86
WASHINGTON STATE UNIV PULLMAN
(AFOSR 69-1216)
AD-621 219 FLD.7/4

•AF AFOSR62 90
PRINCETON UNIV N J
AD-621 906 FLD.21/9.1

•AF AFOSR641 69
MASSACHUSETTS INST OF TECH
CAMBRIDGE AEROPHYSICS LAB
(AFOSR 69-1149)
AD-621 525 FLD.20/4

•AF AFOSR660 69
TASMANIA UNIV HOBART (AUSTRALIA)
DEPT OF MATHEMATICS
(AFOSR 69-1399)
AD-621 398 FLD.12/1

•AF AFOSR699 69
CALIFORNIA UNIV LOS ANGELES
DEPT OF ENGINEERING
AD-621 223 FLD.12/1

•AF AFOSR729 69

LEHIGH UNIV BETHLEHEM PA
CENTER FOR THE INFORMATION SCIENCES
AD-621 128 FLD.5/7

•AF AFOSR73 63
PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF PHYSICS
(AFOSR 65-1182)
AD-621 927 FLD.20/12

•AF AFOSR766 65
TEXAS UNIV AUSTIN LABS FOR ELECTRONICS AND RELATED SCIENCE RESEARCH
(AFOSR 65-1715)
AD-620 913 FLD.9/3

•AF AFOSR781 65
CHICAGO UNIV ILL INST FOR THE STUDY OF METALS
(AFOSR 65-1219)
AD-621 938 FLD.7/3

•AF AFOSR83 63
CALIFORNIA UNIV LOS ANGELES
(AFOSR 65-1105)
AD-621 935 FLD.3/1

•AF AFOSR862 65
JOHN CARROLL UNIV CLEVELAND OHIO
(AFOSR 65-1193)
AD-621 606 FLD.20/12

•AF AFOSR90 63
JOHNS HOPKINS UNIV BALTIMORE MD
(AFOSR 65-1408)
AD-621 536 FLD.12/1

•AF EOAR100 63
OSLO UNIV (NORWAY) INST OF PHYSICS
(AFOSR 65-1354)
AD-621 353 FLD.20/8

•AF EOAR103 63
BRUSSELS UNIV (BELGIUM) LABORATOIRE DE MORPHOLOGIE ANIMALE
(AFOSR 65-1336)
F AD-621 165 FLD.6/1

•AF EOAR119 63
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE MARSEILLE (FRANCE)
(AFOSR 65-1293)
AD-621 913 FLD.6/16

•AF EOAR12 63
LUND UNIV (SWEDEN) DEPT OF PHARMACOLOGY
(AFOSR 65-1367)
F AD-621 167 FLD.6/15

•AF EOAR27 65
HEBREW UNIV JERUSALEM (ISRAEL)
(AFOSR 65-1403)
AD-621 264 FLD.12/1

•AF EOAR3 64
OXFORD UNIV (ENGLAND)
(AFOSR 65-1295)
AD-621 960 FLD.6/16

•AF EOAR36 62
OSLO UNIV (NORWAY) NEUROPHYSIOLOGICAL LAB
(AFOSR 65-1290)
AD-620 945 FLD.6/16

•AF EOAR53 63
UPPSALA UNIV (SWEDEN) DEPT OF PHYSICS
(AFOSR 65-1385)
AD-621 313 FLD.20/2
(AFOSR 65-1175)
AD-621 615 FLD.11/6

•AF EOAR62 106
GENOA UNIV (ITALY) CLINICA NEUROCHIRURGICA
(AFOSR 65-1291)
AD-621 599 FLD.6/16

•AF EOAR62 54
SHEFFIELD UNIV (ENGLAND) DEPT OF PHYSICS
(AFOSR 65-1381)
AD-621 348 FLD.20/8

•AF EOAR62 61
TECHNION -ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
(AFOSR 65-1235)
AD-621 342 FLD.20/12

•AF EOAR62 87
IMPERIAL COLL OF SCIENCE AND TECH LONDON (ENGLAND)
(AFOSR 65-1350)
AD-621 399 FLD.20/8

•AF EOAR62 88
MANCHESTER COLL OF SCIENCE AND TECHNOLOGY (ENGLAND) DEPT OF CHEMISTRY
(AFOSR 65-1239)
F AD-621 216 FLD.7/4

•AF EOAR63 114
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE MARSEILLE (FRANCE)
(AFOSR 65-1294)
AD-621 281 FLD.6/12

•AF EOAR63 98
TECHNION -ISRAEL INST OF TECH HAIFA DEPT OF AERONAUTICAL ENGINEERING
(AFOSR 65-1235)
AD-621 342 FLD.20/12

•AF EOAR63 98
POLITECNICO DI TORINO (ITALY)
(AFOSR 65-1321)
AD-621 604 FLD.14/2

•AF EOAR64 31
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
(AFOSR 65-1302)
AD-620 829 FLD.6/16

•AF EOAR64 92
UNIVERSITY COLL LONDON (ENGLAND)
(AFOSR 65-1368)
F AD-621 129 FLD.6/3

•AF EOAR65 63
TECHNION -ISRAEL INST OF TECH HAIFA
(AFOSR 65-1361)
AD-621 260 FLD.9/3

•AF EOAR8 63
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
(AFOSR 65-1247)
AD-621 266 FLD.7/4
(AFOSR 65-1248)
AD-621 267 FLD.7/2
(AFOSR 65-1244)
AD-621 282 FLD.7/2
(AFOSR 65-1245)
AD-621 283 FLD.7/2
(AFOSR 65-1246)
AD-621 346 FLD.7/2

•AF12 628 3880
AMERICAN METEOROLOGICAL SOCIETY BOSTON MASS
(TT 65-63976)
AD-621 923 FLD.20/13

•AF19 604 7344
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
(AFOSR 65-1379)
AD-621 191 FLD.14/2
(AFOSR 65-1174)
AD-621 302 FLD.20/3

•AF19 604 7399
SAINT LOUIS UNIV MO INST OF TECH
(AFCRL 65-500)
AD-621 232 FLD.8/11

•AF19 604 8892
BARKLEY AND DEXTER LABS INC FITCHBURG MASS
(AFCRL 65-102)
F AD-621 046 FLD.8/2

•AF19 628 1693
MICHIGAN UNIV ANN ARBOR DEPT OF METEOROLOGY AND OCEANOGRAPHY
(AFCRL 65-584)
F AD-620 919 FLD.4/2

•AF19 628 2357
POLYTECHNIC INST OF BROOKLYN N Y MICROWAVE RESEARCH INST
(AFCRL 65-534)
AD-621 039 FLD.20/3

•AF19 628 2390
MITRE CORP BEDFORD MASS
(ESD TR-64-91)
AD-621 210 FLD.9/5
(ESD TDR-63-471)
AD-621 498 FLD.9/11

•AF19 628 2496
NEW YORK UNIV N Y DEPT OF PHYSICS
(AFCRL 65-240)
F AD-621 138 FLD.20/3

•AF19 628 2498
YALE UNIV NEW HAVEN CONN
(AFCRL 65-549)
F AD-621 972 FLD.20/6

•AF19 628 2499
ATMOSPHERIC RESEARCH AND DEVELOPMENT CORP KANSAS CITY MO
(AFCRL 65-561)
F AD-621 973 FLD.4/2

•AF19 628 2682
NEW YORK UNIV N Y SCHOOL OF ENGINEERING AND SCIENCE
(AFCRL 65-294)
F AD-620 938 FLD.20/12

•AF19 628 299
MCGILL UNIV MONTREAL (QUEBEC) STORMY WEATHER GROUP
(AFCRL 65-594)
AD-621 153 FLD.4/2

•AF19 628 2902
STANFORD RESEARCH INST MENLO PARK CALIF
SRI 4523
(AFCRL 64-376 (II))
F AD-621 039 FLD.9/2

•AF19 628 3292
SPACE AND INFORMATION SYSTEMS DIV NORTH AMERICAN AVIATION INC DOWNEY CALIF
(AFCRL 65-596)
F AD-621 938 FLD.13/2

•AF19 628 379
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
(AFCRL 65-529)
AD-621 324 FLD.9/3

•AF19 628 3826
PARKE MATHEMATICAL LABS INC CARLISLE MASS
(AFCRL 65-597)
AD-621 986 FLD.9/4

•AF19 628 3877
HARVARD COLL CAMBRIDGE MASS
PRESIDENT AND FELLOWS
(AFCRL 69-347)
AD-621 364 FLD.20/13

•AF19 628 3880
AMERICAN METEOROLOGICAL SOCIETY
BOSTON MASS
(TT 69-63971)
AD-621 918 FLD.4/2
(TT 69-63972)
AD-621 919 FLD.4/2
(TT 69-63973)
AD-621 920 FLD.20/12
(TT 69-63974)
AD-621 921 FLD.14/5
(TT 69-63975)
AD-621 922 FLD.4/2
(TT 69-63977)
AD-621 924 FLD.20/12
(TT 69-63978)
AD-621 925 FLD.12/1

•AF19 628 4014 GRANT
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
(AFCRL 69-536)
AD-621 370 FLD.4/2

•AF19 628 4073
SYLVANIA ELECTRONIC SYSTEMS WALTHAM MASS APPLIED RESEARCH LAB
(ESD TR-69-461)
F AD-621 278 FLD.6/16

•AF19 628 408
STANLEY COBB LABS FOR PSYCHIATRIC RESEARCH MASSACHUSETTS GENERAL HOSPITAL BOSTON
(AFCRL 69-580)
AD-621 277 FLD.6/16

•AF19 628 4308
ADCOM INC CAMBRIDGE MASS
(AFCRL 69-535)
F AD-620 937 FLD.20/14

•AF19 628 4321
NEW YORK UNIV N Y LAB FOR ELECTROSCIENCE RESEARCH
(AFCRL 69-461)
AD-621 323 FLD.9/4

•AF19 628 4337
ILLINOIS UNIV URBANA DEPT OF ELECTRICAL ENGINEERING
(AFOSR 69-1179)
AD-621 309 FLD.20/12

•AF19 628 4769
PHILCO CORP BLUE BELL PA
ADVANCED TECHNOLOGY CENTER
(AFCRL 69-591)
AD-621 559 FLD.9/5

•AF19 628 4995
ARCTIC METEOROLOGY RESEARCH GROUP MCGILL UNIV MONTREAL (QUEBEC)
(AFCRL 69-488)
AD-621 073 FLD.4/2

•AF19 628 4999
UTAH UNIV SALT LAKE CITY
UPPER AIR RESEARCH LABS
(AFCRL 69-480)
AD-621 499 FLD.9/5

•AF19 628 5167
LINCOLN LAB MASS INST OF TECH
LEXINGTON
(ESD TDR-69-314)
AD-620 872 FLD.9/5
(ESD TDR-69-436)
AD-621 113 FLD.20/3
(ESD TDR-69-319)
AD-621 114 FLD.20/6
(ESD TDR-69-320)
AD-621 202 FLD.9/4
(ESD TDR-69-430)
AD-621 204 FLD.20/6
(ESD TDR-69-431)
AD-621 205 FLD.20/12
(ESD TDR-69-434)
AD-621 206 FLD.9/1
(ESD TDR-69-435)
AD-621 207 FLD.9/2
(ESD TDR-69-437)
AD-621 208 FLD.20/6
(ESD TDR-69-324)
AD-621 233 FLD.4/2
(ESD TDR-69-421)
AD-621 510 FLD.9/1
(ESD TDR-69-429)
AD-621 116 FLD.20/10
(ESD TDR-69-427)
AD-621 234 FLD.20/10
(ESD TDR-69-443)
AD-621 568 FLD.20/14

•AF29 601 6059
WEIDLINGER (PAUL) NEW YORK
(WL TR-69-59)
AD-621 363 FLD.8/11

•AF29 601 6344
NATIONAL CASH REGISTER CO DAYTON OHIO CAPSULAR RESEARCH AND PRODUCT DEVELOPMENT
(WL TR-64-167)
AD-620 933 FLD.6/13

•AF29 601 6368
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CIVIL ENGINEERING
(AFWL TR-69-99)
AD-621 145 FLD.13/13

•AF29 601 6409
POULTER LABS STANFORD RESEARCH INST MENLO PARK CALIF
AD-621 487 FLD.20/13

•AF30 602 2696
SYRACUSE UNIV RESEARCH INST N Y DEPT OF ELECTRICAL ENGINEERING
(RADC TR-69-215)
AD-620 934 FLD.9/5

•AF30 602 3025
MICROWAVE ELECTRONICS CORP PALO ALTO CALIF
(RADC TR-69-535)
AD-620 893 FLD.9/1

•AF30 602 3048
SYLVANIA ELECTRIC PRODUCTS INC WOBURN MASS SEMICONDUCTOR DIV
(RADC TDR-64-498)
F AD-620 919 FLD.9/1

•AF30 602 3193
CRAIG SYSTEMS INC LAWRENCE MASS
(RADC TR-69-252)
AD-621 247 FLD.15/4

•AF30 602 3269
WESTINGHOUSE ELECTRIC CORP BALTIMORE MD
(RADC TR-69-125)
F AD-621 520 FLD.9/2

•AF30 602 3268
HUGHES AIRCRAFT CO FULLERTON CALIF GROUND SYSTEMS GROUP
(RADC TR-69-96)
F AD-621 074 FLD.13/8

•AF30 602 3292
AIRBORNE INSTRUMENTS LAB MELVILLE N Y
(RADC TR-69-187)
F AD-621 282 FLD.9/3

•AF30 602 3302
FRANKLIN INST RESEARCH LABS PHILADELPHIA PA
(RADC TR-69-198)
F AD-621 231 FLD.17/2

•AF30 602 3368
STANFORD RESEARCH INST MENLO PARK CALIF
(RADC TR-69-294)
F AD-621 290 FLD.9/1

•AF30 602 3371
GENERAL PRECISION INC GLENDALE CALIF
(RADC TR-69-210)
F AD-621 516 FLD.9/2

•AF30 602 3389
AMERICAN OPTICAL CO SOUTHBRIDGE MASS RESEARCH DIV
(RADC TR-69-237)
F AD-621 227 FLD.20/6

•AF30 602 3471
MARQUARDT CORP VAN NUYS CALIF
(RADC TR-69-178)
F AD-620 915 FLD.9/2

•AF30 602 3478
MOTOROLA INC PHOENIX ARIZ SEMICONDUCTOR PRODUCTS DIV
(RADC TR-69-203)
AD-620 854 FLD.9/1

•AF30 602 3481
RAYTHEON CO BURLINGTON MASS MICROWAVE AND POWER TUBE DIV
(RADC TR-69-224)
F AD-621 517 FLD.9/1

•AF30 602 3488
GENERAL ELECTRIC CO SUNNYVALE CALIF COMPUTER LAB
(RADC TR-69-282)
F AD-621 577 FLD.9/2

•AF30 602 3490
SPERRY MICROWAVE ELECTRONICS CO CLEARWATER FLA
AD-621 136 FLD.9/1

•AF30 602 3597
INFORMATICS INC CULVER CITY CALIF
(RADC TR-69-235)
F AD-621 519 FLD.15/4

•AF30 602 3605
SHOCKLEY LAB ITT SEMICONDUCTOR PALO ALTO CALIF
(RADC TR-69-141)
AD-621 075 FLD.20/12

•AF30 602 3706
WESTINGHOUSE RESEARCH LABS PITTSBURGH PA
(RADC TR-69-369)
F AD-620 940 FLD.13/12

•AF33 038 20839
UTAH UNIV SALT LAKE CITY INST FOR THE STUDY OF RATE PROCESSES
(AFOSR TR-56-52)
F AD-620 899 FLD.21/2

•AF33 615 1418
MEASUREMENT ANALYSIS CORP LOS ANGELES CALIF
(FDL TR-69-57)
F AD-620 987 FLD.12/1
(FDL TR-69-60)
F AD-620 988 FLD.1/3
(FDL TR-69-93)
F AD-621 039 FLD.9/3

•AF33 615 1557
COMPUTER CONCEPTS INC SILVER SPRING MD
(AMRL TR-69-131)
F AD-621 379 FLD.9/10

•AF33 615 1903

LOCKHEED-CALIFORNIA CO BURBANK
(AMRL TR-65-89)
F AD-621 380 FLD.22

•AF33 615 2884
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
AD-620 849 FLD.20/6

•AF33 615 3108
ELECTRONIC DEFENSE LABS SYLVANIA ELECTRONIC SYSTEMS-WEST MOUNTAIN VIEW CALIF
AD-620 825 FLD.17/2

•AF33 615 69 1007
BUREAU OF MINES PITTSBURGH PA
AD-620 899 FLD.13/12

•AF33 615 65 5002
FOREST PRODUCTS LAB MADISON WIS
AD-621 552 FLD.11/7
AD-621 553 FLD.20/12

•AF33 616 2279
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
AD-621 439 FLD.1/3

•AF33 616 6968
MELLON INST PITTSBURGH PA
(ASD TR-61-22)
AD-620 887 FLD.11/9

•AF33 616 8121
MICROWAVE LAB STANFORD UNIV CALIF
(ARL 65-115)
AD-620 910 FLD.20/3

•AF33 616 8130
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y RESEARCH DEPT
(FDL TDR-64-124)
AD-620 959 FLD.16

•AF33 616 8378
INDIANA UNIV MEDICAL CENTER INDIANAPOLIS
(AMRL TR-65-136)
AD-621 229 FLD.6/16

•AF33 657 10186 GRANT
EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZURICH (SWITZERLAND)
AD-620 886 FLD.20/12

•AF33 657 10639
PHILLIPS PETROLEUM CO BARTLESVILLE OKLA
(APL TDR-64-89 P2)
AD-621 931 FLD.21/4

•AF33 657 11060
OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS AERODYNAMIC LAB
(ARL 65-112)
AD-620 909 FLD.20/4
(ARL 65-122)
AD-621 574 FLD.14/2

•AF33 657 11088
SOUTHWEST RESEARCH INST SAN ANTONIO TEX
(APL TR-65-70)
AD-621 072 FLD.14/2

•AF33 657 11115
SPACE AND INFORMATION SYSTEMS DIV NORTH AMERICAN AVIATION INC DOWNEY CALIF
SID 64 2074 1
(FDL TR-65-17 P1)
F AD-621 146 FLD.20/4

•AF33 657 11737
PURDUE UNIV LAFAYETTE IND
DEPT OF STATISTICS
AD-621 150 FLD.12/1
AD-621 151 FLD.12/1

•AF33 657 63 358
FOREST PRODUCTS LAB MADISON WIS
AD-621 576 FLD.11/9

•AF33 657 7879
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES
AD-621 448 FLD.19/4

•AF33 657 7916
HARSHAW CHEMICAL CO CLEVELAND OHIO
(ARL 65-111)
F AD-621 454 FLD.10

•AF33 657 8833
LOCKHEED-CALIFORNIA CO BURBANK
LR 18803 VOL. 1
(FDL TR-65-123 V1)
F AD-621 343 FLD.20/4

•AF33 657 8883
LOCKHEED-CALIFORNIA CO BURBANK
LR 18803 VOL. 2
(FDL TR-65-123 V2)
F AD-621 344 FLD.20/4

•AF40 600 1070
LOCKHEED MISSILES AND SPACE CO PALO ALTO CALIF MATERIALS SCIENCES LAB
AD-621 163 FLD.9/3

•AF49 638 1015
ASTROMECHANICS RESEARCH DIV GIANNINI CONTROLS CORP MALVERN PA
(AFOSR 65-104)
AD-620 866 FLD.22
(AFOSR 65-0952)
AD-620 867 FLD.20/4

•AF49 638 1018
RUTGERS -THE STATE UNIV NEW BRUNSWICK N J DEPT OF PHYSICS
(AFOSR 65-1562)
F AD-621 218 FLD.20/2

•AF49 638 1028
STANFORD RESEARCH INST MENLO PARK CALIF
(AFOSR 65-1307)
AD-621 253 FLD.9/9

•AF49 638 1190
GEOTECHNICAL CORP GARLAND TEX
AD-621 224 FLD.8/11

•AF49 638 1207
GRUMMAN AIRCRAFT ENGINEERING CORP BETHPAGE N Y
(AFOSR 65-1360)
AD-621 189 FLD.22

•AF49 638 1221
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS
(AFOSR 65-1241)
F AD-621 276 FLD.10

•AF49 638 1242
RIAS INC BALTIMORE MD
(AFOSR 65-1390)
AD-621 133 FLD.12/1

•AF49 638 1250
TEXAS INSTRUMENTS INC DALLAS
(AFOSR 65-1180)
AD-621 297 FLD.20/12

•AF49 638 1254
COLUMBIA UNIV NEW YORK PLASMA LAB
(AFOSR 65-1265)
AD-621 200 FLD.20/4

•AF49 638 1282
TUFTS UNIV MEDFORD MASS
(AFOSR 65-1365)
AD-621 187 FLD.9/10

•AF49 638 1322
CALIFORNIA INST OF TECH PASADENA QUANTUM ELECTRONICS LAB
(AFOSR 65-1000)
AD-621 319 FLD.20/6
(AFOSR 65-0999)
AD-621 320 FLD.20/6

•AF49 638 1341
STANFORD UNIV CALIF DEPT OF CHEMISTRY
(AFOSR 65-1215)
AD-621 305 FLD.11/9
(AFOSR 65-1214)
AD-621 306 FLD.11/9
(AFOSR 65-1444)
AD-621 398 FLD.20/13

•AF49 638 1345 GRANT
STANFORD UNIV CALIF DEPT OF MATHEMATICS
(AFOSR 65-1399)
AD-621 352 FLD.12/1

•AF49 638 1362
GENERAL ELECTRIC RESEARCH LAB SCHENECTADY N Y
(AFOSR 65-1451)
AD-621 490 FLD.7/4

•AF49 638 1468
NATIONAL MAGNET LAB MASS INST OF TECH CAMBRIDGE
(AFOSR 65-1181)
AD-621 303 FLD.20/12

•AF49 638 1516
BUNKER-RAMO CORP CANOGA PARK CALIF
(AFOSR 65-1386)
AD-621 159 FLD.9/7

•AF49 638 217
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF AEROSPACE ENGINEERING AND APPLIED MECHANICS
(AFOSR 3428)
AD-621 162 FLD.20/4

•AF49 638 330
UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF CHEMISTRY
(AFOSR 969)
F AD-621 226 FLD.7/3

•AF49 638 331
POLYTECHNIC INST OF BROOKLYN N Y
AD-621 235 FLD.7/3
POLYTECHNIC INST OF BROOKLYN N Y DEPT OF CHEMISTRY
(AFOSR 3784)
F AD-621 228 FLD.11/9
POLYTECHNIC INST OF BROOKLYN N Y INST OF POLYMER RESEARCH
(AFOSR 2062)
AD-621 229 FLD.7/3

•AF49 638 381
PRINCETON UNIV N J
(AFOSR 65-1306)
AD-621 190 FLD.9/10

•AF49 638 417
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
(AFOSR 65-1377)
AD-621 308 FLD.20/6
ILLINOIS UNIV URBANA DEPT OF ELECTRICAL ENGINEERING
(AFOSR 65-1179)
AD-621 309 FLD.20/12

•AF49 638 431
PRINCETON UNIV N J
(AFOSR 3386)

AD-621 912 FLD.12/1

•AF49 638 992
MASSACHUSETTS INST OF TECH
CAMBRIDGE DEPT OF MECHANICAL ENGINEERING
(AFOSR 3492)
AD-621 242 FLD.20/9
(AFOSR 3493)
AD-621 243 FLD.20/13

•AF49 638 967
PRINCETON UNIV N J
(AFOSR 69-1493)
F AD-621 272 FLD.7/3

•AF49 638 913
STANFORD UNIV CALIF DIV OF ENGINEERING MECHANICS
(AFOSR 2928)
AD-621 137 FLD.19/2

•AF49 638 700
RAND CORP SANTA MONICA CALIF
AD-620 834 FLD.22
AD-620 835 FLD.20/3
AD-620 876 FLD.22
AD-620 896 FLD.9/2
AD-620 927 FLD.9/9
AD-620 932 FLD.5/11
AD-621 044 FLD.8/19
AD-621 310 FLD.5/7
AD-621 311 FLD.5/7
AD-621 959 FLD.12/1

•AF49 638 713
HARVARD UNIV BOSTON MASS
NEUROPHYSIOLOGY LAB
(AFOSR 1982)
AD-621 937 FLD.6/16

•AF49 638 713 GRANT
HARVARD UNIV BOSTON MASS
NEUROPHYSIOLOGY LAB
(AFOSR 1389)
AD-621 926 FLD.6/16

•AF49 638 718
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES DEPT OF CHEMISTRY
(AFOSR 267)
AD-621 222 FLD.7/3
(AFOSR 2323)
AD-621 910 FLD.7/3

•AF49 638 728
MASSACHUSETTS MENTAL HEALTH CENTER BOSTON
(AFOSR 69-1161)
AD-621 900 FLD.5/10

•AF49 638 751
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL
WASHINGTON D C COMMITTEE
(AFOSR 721)
AD-621 241 FLD.3/1

•AF49 638 826
PENNSYLVANIA STATE UNIV UNIVERSITY PARK
(AFOSR 3038)
AD-621 219 FLD.12/1
(AFOSR 3285)
AD-621 238 FLD.12/1
(AFOSR 3286)
AD-621 239 FLD.12/1

•AF49 638 848
RUTGERS -THE STATE UNIV NEW BRUNSWICK N J GRADUATE SCHOOL OF LIBRARY SERVICE
AD-621 908 FLD.5/2

•AF49 638 863
MINNESOTA UNIV MINNEAPOLIS
DEPT OF MATHEMATICS
(AFOSR 939)
AD-621 217 FLD.12/1
(AFOSR 2794)
AD-621 219 FLD.12/1

•AF49 638 879 GRANT
NORTHWESTERN UNIV EVANSTON ILL GAS DYNAMICS LAB
(AFOSR 69-1338)
AD-621 213 FLD.20/3

•AF49 638 992
BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D C
(AFOSR 69-0719)
AD-621 135 FLD.5/10

•AF61 052 162
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
(AFOSR 69-1991)
AD-621 961 FLD.20/2

•AF61 052 162 GRANT
ROYAL INST OF TECH STOCKHOLM (SWEDEN) DEPT OF INORGANIC CHEMISTRY
(AFOSR 69-1244)
AD-621 282 FLD.7/2

•AF61 052 401
HEBREW UNIV JERUSALEM (ISRAEL)
DEPT OF PHYSICS
(AFOSR 69-1237)
AD-621 348 FLD.20/4
(AFOSR 69-1238)
AD-621 559 FLD.20/4

•AF61 052 404
LONDON UNIV (ENGLAND) DEPT OF BIOCHEMISTRY
(AFOSR 69-1497)
AD-621 404 FLD.6/1

•AF61 052 409 GRANT
UNIVERSITY COLL GALWAY (EIRE)
DEPT OF CHEMISTRY
(AFOSR 69-1289)
AD-621 403 FLD.6/1

•AF61 052 490
INNSBRUCK UNIV (AUSTRIA)
(AFCRL 69-629)
AD-621 518 FLD.19/2

•AF61 052 543
ECOLE NORMALE SUPERIEURE PARIS (FRANCE)
(AFCRL 69-588)
AD-621 049 FLD.20/12

•AF61 052 710
LILLE UNIV (FRANCE)
(AFOSR 69-1227)
F AD-621 251 FLD.20/4

•AF61 052 799
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH
(AFCRL 69-627)
AD-621 037 FLD.20/12
(AFCRL 69-628)
AD-621 038 FLD.20/12

•AF61 052 769
GRONINGEN UNIV (NETHERLANDS)
LAB OF CHEMISTRY
(AFCRL 69-928)
AD-620 848 FLD.7/4

•AF61 052 780
QUEEN'S UNIV BELFAST (NORTHERN IRELAND) DEPT OF APPLIED MATHEMATICS
(AFCRL 69-690)
AD-620 844 FLD.7/4
(AFCRL 69-691)
AD-620 845 FLD.20/8
(AFCRL 69-692)
AD-620 846 FLD.20/8

•AF61 052 789
ECOLE NORMALE SUPERIEURE PARIS (FRANCE)
(AFCRL 69-590)
AD-621 076 FLD.20/2

•AF61 052 799
TECHNICAL UNIV OF DENMARK
LYNGBY LAB OF ELECTROMAGNETIC THEORY
(AFCRL 69-593)
AD-621 047 FLD.9/5
(AFCRL 69-972)
AD-621 048 FLD.9/5

•AF61 052 806
SOREQ RESEARCH ESTABLISHMENT ISRAEL ATOMIC ENERGY COMMISSION YAVNEH
(AFCRL 69-657)
AD-621 036 FLD.20/12

•AF61 052 811
NORWEGIAN INST OF COSMIC PHYSICS UNIV OF OSLO
(AFCRL 69-512)
AD-620 870 FLD.4/2

•ARDS983
COLLINS RADIO CO CEDAR RAPIDS IOWA
(SRDS RD-69-137)
F AD-620 985 FLD.17/7

•ARDD DA31 124 61624
SYRACUSE UNIV N Y
(AROD 2465:6)
AD-621 417 FLD.20/12

•AT40 1 2687 GRANT
FLORIDA STATE UNIV TALLAHASSEE
(AFOSR 69-1286)
AD-621 285 FLD.6/1

•AT49 7 1963
NAVAL RADIOLOGICAL DEFENSE LAB SAN FRANCISCO CALIF
AD-621 312 FLD.18/8

•AT49 7 2435
NAVAL RESEARCH LAB WASHINGTON D C
AD-621 565 FLD.18/8

•CWB10622
MIAMI UNIV CORAL GABLES FLA
INST OF MARINE SCIENCE
F AD-621 155 FLD.4/2

•CWB10888
EASTERN AIR LINES INC MIAMI FLA METEOROLOGY DEPT
F AD-620 989 FLD.4/2

•DA ARO D31 1246122
CINCINNATI UNIV OHIO
(AROD 2276:11-C)
AD-621 406 FLD.7/3

•DA ARO D31 1246185
NORTH CAROLINA UNIV CHAPEL HILL
F AD-621 554 FLD.7/3

•DA ARO D31 1246331
PENNSYLVANIA UNIV PHILADELPHIA
(AROD 3734:6)
AD-620 982 FLD.20/12
TOWNE SCHOOL OF CIVIL AND MECHANICAL ENGINEERING UNIV OF PENNSYLVANIA PHILADELPHIA
(AROD 3734:9)
AD-621 265 FLD.20/3

•DA ARO D31 1246341
LEHIGH UNIV BEHTLEHEM PA
DEPT OF CHEMISTRY
(AROD 3603:2)
AD-620 943 FLD.7/4

•DA ARO D31 1246384
CALIFORNIA UNIV DAVIS
(AROD 3861:2)
F AD-620 868 FLD.7/4

•DA ARO D31 1246484

BROWN UNIV PROVIDENCE R I
(AROD 1271:49)
AD-620 830 FLD.20/4

•DA ARO D31 1246494
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
(AROD 4127:3)
AD-621 620 FLD.7/3
(4127:4)
AD-621 623 FLD.7/3

•DA ARO D31 1246501
CHICAGO UNIV ILL
(AROD 4197:1)
AD-621 605 FLD.12/1

•DA ARO D31 1246529
CALIFORNIA UNIV DAVIS
(AROD 3861:2)
F AD-620 868 FLD.7/4

•DA ARO D31 1246607
YALE UNIV NEW HAVEN CONN
AD-621 619 FLD.20/8

•DA ARO D31 1246659
PENNSYLVANIA STATE UNIV UNIVERSITY PARK IONOSPHERE RESEARCH LAB
AD-621 974 FLD.9/5
AD-621 375 FLD.4/2
AD-621 376 FLD.4/2

•DA ARO49 092 63 12
UNIVERSIDAD NACIONAL DE CUYO SAN CARLOS DE BARILOCHE (ARGENTINA) INSTITUTO DE
F AD-621 077 FLD.11/6

•DA ARO49 092 64636
UNIVERSIDAD NACIONAL DE CUYO SAN CARLOS DE BARILOCHE (ARGENTINA) INSTITUTO DE
F AD-621 077 FLD.11/6

•DA ARO49 092 64643
INSTITUTO TECNOLOGICO Y DE ESTUDIOS SUPERIORES DE MONTERREY (MEXICO)
AD-621 958 FLD.20/8

•DA11 022ORD2059
MATHEMATICS RESEARCH CENTER UNIV OF WISCONSIN MADISON
(AFOSR 65-1358)
AD-621 395 FLD.3/1

•DA18 035AMC2114
BECKMAN INSTRUMENTS INC FULLERTON CALIF SPECIAL PROJECTS DIV
F AD-621 347 FLD.17/5

•DA18 108AMC1484
HARVARD UNIV BOSTON MASS MEDICAL SCHOOL
F AD-621 078 FLD.6/16

•DA19 129AMC2111
EVANS RESEARCH AND DEVELOPMENT CORP NEW YORK
(USA-NLABS FD-14)
AD-620 935 FLD.6/8

•DA19 129AMC71N
BJORKSTEN RESEARCH FOUNDATION MADISON WIS
(USA-NLABS FD-18)
AD-620 885 FLD.6/1

•DA19 129QM1984
MIDWEST RESEARCH INST KANSAS CITY MO
(USA-NLABS FD-20)
AD-620 884 FLD.6/8

•DA20 018ORD22743 GRANT
WAYNE STATE UNIV DETROIT MICH DEPT OF CHEMISTRY
(4127:4)
AD-621 623 FLD.7/3

•DA28 043AMC00040E
FAIRCHILD SEMICONDUCTOR RESEARCH AND DEVELOPMENT LABS PALO ALTO CALIF
AD-621 084 FLD.9/1

•DA28 043AMC00119E
TEXAS INSTRUMENTS INC DALLAS
F AD-621 932 FLD.9/1

•DA28 043AMC00160E
KAYSAM CORP OF AMERICA PATERSON N J
F AD-620 912 FLD.1/3

•DA28 043AMC00161E
PHILCO BLUE BELL PA APPLIED RESEARCH LAB
AD-621 362 FLD.9/1

•DA28 043AMC00173E
NATIONAL ENGINEERING SCIENCE CO HOUSTON TEX
F AD-621 256 FLD.4/2

•DA28 043AMC00176E
COLLINS RADIO CO DALLAS TEX
AD-621 033 FLD.9/1

•DA28 043AMC00446E
MICROWAVE LAB STANFORD UNIV CALIF
AD-621 488 FLD.20/6

•DA28 043AMC01223E
ELECTRONIC ASSOCIATES INC LONG BRANCH N J
AD-620 941 FLD.17/2

•DA29 040AMC746R
ELECTRO-MECHANICAL RESEARCH INC SARASOTA FLA
F AD-621 139 FLD.17/2.1
F AD-621 140 FLD.17/2.1

•DA31 124ARO D124
SLOANE PHYSICS LAB YALE UNIV NEW HAVEN CONN
(AROD 4913:8)
AD-621 110 FLD.20/6

•DA31 124ARO D128
HARVARD UNIV CAMBRIDGE MASS
(AROD 1617:48)
AD-621 507 FLD.12/1

•DA31 124ARO D144
NORTHWESTERN UNIV EVANSTON ILL
(AROD 4489:2)
AD-621 109 FLD.12/1

•DA31 124ARO D162
METCALF CHEMICAL LABS BROWN UNIV PROVIDENCE R I
(AROD 4676:2)
AD-620 942 FLD.7/2

•DA31 124ARO D190
CARNEGIE INST OF TECH PITTSBURGH PA DEPT OF METALLURGICAL ENGINEERING
(AROD 4838:1)
AD-621 132 FLD.9/1

•DA31 124ARO D221
UNITED AIRCRAFT CORP EAST HARTFORD CONN RESEARCH LABS
F AD-621 501 FLD.20/3

•DA31 124ARO D233
NORTHWESTERN UNIV EVANSTON ILL DEPT OF MATERIALS SCIENCE
(AROD 4975:1)
AD-621 603 FLD.11/6

•DA31 124ARO D262
LTV VOUGHT AERONAUTICS DIV LING-TEMCO-VOUGHT INC DALLAS TEX
(AROD 5260:5)
AD-621 578 FLD.1/3

•DA31 124ARO D322
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
AD-621 476 FLD.12/1
AD-621 512 FLD.9/1

•DA31 124ARO D331
OPERATIONS RESEARCH CENTER UNIV OF CALIF BERKELEY
AD-621 550 FLD.12/1

•DA31 124ARO D35
NOYES CHEMICAL LAB UNIV OF ILLINOIS URBANA
(AROD 3815:4)
AD-621 619 FLD.7/3

•DA31 124ARO D369
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
AD-621 556 FLD.20/6

•DA31 124ARO D422
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
AD-621 477 FLD.15/7

•DA36 039ORD39142
RIAS INC BALTIMORE MD
(AFOSR 69-1390)
AD-621 133 FLD.12/1

•DA36 039AMC00039E
ELECTRICAL ENGINEERING RESEARCH LAB CORNELL UNIV ITHACA N Y
AD-621 149 FLD.9/1

•DA36 039AMC00065E
COLUMBIA UNIV NEW YORK DEPT OF CIVIL ENGINEERING AND ENGINEERING MECHANICS
A AD-620 890 FLD.20/12

•DA36 039AMC01461E
INTERNATIONAL RESISTANCE CO PHILADELPHIA PA
AD-620 923 FLD.9/1

•DA36 039AMC01473E
ASSEMBLY PRODUCTS INC CHESTERLAND OHIO
AD-621 211 FLD.14/2

•DA36 039AMC01476E
TUNG-SOL ELECTRIC INC BLOOMFIELD N J ELECTRON TUBE DIV
AD-621 549 FLD.9/1

•DA36 039AMC02229E
MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF METEOROLOGY
AD-620 852 FLD.17/9

•DA36 039AMC02238
YARDNEY ELECTRIC CORP NEW YORK
AD-621 583 FLD.10/3

•DA36 039AMC03378E
ELECTRONICS RESEARCH LAB MONTANA STATE COLL BOZEMAN
F AD-621 147 FLD.9/1

•DA36 039AMC04169E
GENERAL ELECTRIC CO HUNTSVILLE ALA COMPUTER DEPT
AD-621 557 FLD.11/9

•DA36 039SC88976
CTS CORP ELKHART IND RESEARCH AND DEVELOPMENT DIV
AD-621 355 FLD.9/1

•DA36 039SC88908
GENERAL DYNAMICS/ELECTRONICS ROCHESTER N Y RADIO COMMUNICATIONS LAB
F AD-620 907 FLD.9/1

•DA99 009ANC930T
HOLMAN (JOHN F) CO INC WASHINGTON D C
(AERDL T-1801-691)
AD-621 164 FLD.19/1

•DA99 177ANC19T
WALKER (NORMAN K) ASSOCIATES INC BETHESDA MD
(USAAVLABS TR-69-26)
F AD-621 919 FLD.1/3

•DA99 177ANC82T
DYNASCIENCES CORP FORT WASHINGTON PA
(USAAVLABS TR-69-53)
F AD-621 521 FLD.1/3

•DA99 177ANC89T
OKLAHOMA UNIV RESEARCH INST NORMAN
F AD-621 922 FLD.11/7

•DA99 177TC685
NORTHWESTERN UNIV EVANSTON ILL
(USAAVLABS TR-69-39)
F AD-621 914 FLD.13/6

•DA99 007MD696
CALIFORNIA UNIV LOS ANGELES DEPT OF SURGERY
AD-620 960 FLD.6/5
AD-620 962 FLD.6/5
CALIFORNIA UNIV LOS ANGELES DEPT OF& SURGERY
AD-620 961 FLD.6/5

•DA99 193MD2196
MARQUETTE UNIV MILWAUKEE WIS DEPT OF CHEMISTRY
F AD-621 079 FLD.6/15

•DA99 193MD2238
MARYLAND UNIV COLLEGE PARK DEPT OF ZOOLOGY
(TT 69-69002)
AD-621 585 FLD.6/3

•DA99 193MD2291 AT11 1 71
OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY
AD-621 509 FLD.7/3

•DA99 193MD2668
GEORGETOWN UNIV WASHINGTON D C
AD-621 104 FLD.6/3
GEORGETOWN UNIV WASHINGTON D C DEPT OF BIOLOGY
AD-621 493 FLD.6/3
AD-621 494 FLD.6/3

•GRANT PHS B2260
HARVARD UNIV BOSTON MASS NEUROPHYSIOLOGY LAB
(AFOSR 1982)
AD-621 937 FLD.6/16

•GRANT PHS HE08240
INDIANA UNIV MEDICAL CENTER INDIANAPOLIS
(AMRL TR-69-136)
AD-621 225 FLD.6/16

•NAONR12 69
NATIONAL BUREAU OF STANDARDS WASHINGTON D C HEAT DIV
AD-621 589 FLD.7/9

•NBY17828
INTERFERENCE TESTING AND RESEARCH LAB INC BOSTON MASS
F AD-620 826 FLD.9/3

•NIH GM09939
CHICAGO UNIV ILL MUSEUM OF SCIENCE AND INDUSTRY
AD-621 591 FLD.6/1

•NIH HTS9508
NEW YORK STATE UNIV BUFFALO DEPT OF PHYSIOLOGY
AD-620 999 FLD.6/16

•NIH MH09239 03
RESEARCH LAB OF ELECTRONICS MASS INST OF TECH CAMBRIDGE
AD-621 081 FLD.9/10

•NIH NB03937
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE MARSEILLE (FRANCE)
(AFOSR 69-1294)
AD-621 281 FLD.6/12
(AFOSR 69-1293)
AD-621 913 FLD.6/16

•NIH NB04932 02
KAROLINSKA INST STOCKHOLM (SWEDEN) DEPT OF PHYSIOLOGY
(AFOSR 69-1302)
AD-620 829 FLD.6/16

•NIH 2G43C7•8
MINNESOTA UNIV MINNEAPOLIS DEPT OF STATISTICS
AD-621 936 FLD.5/10

•NOBSR81380
WESTINGHOUSE DEFENSE AND SPACE CENTER BALTIMORE MD SURFACE DIV
F AD-621 371 FLD.9/1

•NOBSR81478
RADIO CORP OF AMERICA SOMERVILLE N J ELECTRONIC COMPONENTS AND DEVICES
F AD-620 917 FLD.9/1

•NOBSR93003
CONTROL DATA CORP MINNEAPOLIS MINN
F AD-620 911 FLD.9/2

•NOBSR93306
CHATHAM ELECTRONICS DIV TUNG-SOL ELECTRIC INC LIVINGSTON N J
AD-620 920 FLD.9/1

•NOBS90041
FRITZ ENGINEERING LAB LEHIGH UNIV BETHLEHEM PA
AD-621 989 FLD.20/12

•NOBS90246
UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
AD-620 918 FLD.11/3

•NOBS92060
UNITED STATES RUBBER CO WAYNE N J RESEARCH CENTER
AD-621 032 FLD.11/9

•NONR G00019 69
CALIFORNIA UNIV BERKELEY DEPT OF ASTRONOMY
F AD-621 298 FLD.3/1

•NONR G00079 69
ARIZONA UNIV TUCSON LUNAR AND PLANETARY LAB
F AD-621 249 FLD.3/1

•NONR110026
PURDUE UNIV LAFAYETTE IND DEPT OF STATISTICS
AD-621 181 FLD.12/1

•NONR122923
MICHIGAN UNIV ANN ARBOR DEPT OF PHYSICS
AD-621 069 FLD.20/8

•NONR122810
NORTHWESTERN UNIV EVANSTON ILL TECHNOLOGICAL INST
AD-621 976 FLD.12/1
AD-621 977 FLD.19/7
AD-621 912 FLD.9/1
AD-621 927 FLD.12/1

•NONR162319
LOBUND LAB UNIV OF NOTRE DAME IND
AD-621 903 FLD.6/13

•NONR169501 GRANT
CHICAGO UNIV ILL MUSEUM OF SCIENCE AND INDUSTRY
AD-621 591 FLD.6/1

•NONR172700 GRANT
STRAWBRIDGE OBSERVATORY HAVERFORD COLL A
AD-621 391 FLD.3/1

•NONR180903
ILLINOIS UNIV URBANA
AD-620 906 FLD.20/12

•NONR185803 GRANT
PRINCETON UNIV N J OBSERVATORY
AD-621 905 FLD.3/1

•NONR185830
PALMER PHYSICAL LAB PRINCETON UNIV N J
AD-621 629 FLD.3/1

•NONR186619
LYMAN LAB OF PHYSICS HARVARD UNIV CAMBRIDGE MASS
AD-621 388 FLD.18/2

•NONR212101
CHICAGO UNIV ILL LABORATORY OF MOLECULAR STRUCTURE AND SPECTRA
AD-620 903 FLD.20/8

•NONR219600
WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS
AD-621 367 FLD.4/2
AD-621 368 FLD.20/4
AD-621 369 FLD.8/10

•NONR22047
CALIFORNIA INST OF TECH PASADENA
AD-621 593 FLD.20/8
AD-621 594 FLD.20

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OTHER RESEARCH REPORTS AND RELATED MATERIAL

REPORTS RELEASED BY AEC, NASA, DEPARTMENT OF COMMERCE, OTHER CIVILIAN AGENCIES, AND ALSO CERTAIN OLDER MILITARY REPORTS.

*Descriptors marked with an asterisk are included in the subject index

01. Aeronautics

N65-25725 Field 1D, 1C
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Edwards, Calif. Flight Research Center.
OPERATIONAL EXPERIENCE WITH THE X-15 REACTION CONTROL AND REACTION AUGMENTATION SYSTEMS,
by Calvin R. Jarvis and Wilton P. Lock. Jun 65, 48p NASA-TN-D-2864
Unclassified report

Descriptors: (*Aerospace planes, Flight control systems), (*Flight control systems, Aerospace planes).

N65-25925 Field 1B, 14B, 1D
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
PILOT-VEHICLE SYSTEM SIMULATION FOR LOW-ALTITUDE, HIGH-SPEED FLIGHT,
by Melvin Sadoff and Thomas E. Wempe. Jun 65, 52p NASA-TN-D-2793
Unclassified report

Descriptors: (*Flight simulators, Supersonic flight), (*Supersonic flight, Flight simulators).

N65-26597 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
FREE-FLIGHT MEASUREMENTS OF STAGNATION-POINT CONVECTIVE HEAT TRANSFER AT VELOCITIES TO 41,000 FT/SEC,
by Dale L. Compton and David M. Cooper. Jun 65, 27p NASA-TN-D-2871
Unclassified report

Descriptors: (*Heat transfer, Stagnation point), (*Convection, Heat transfer).

N65-26645 Field 1A
CFSTI Prices: HC$1.00 MF$0.50

California Univ., Los Angeles.
KINETIC THEORY APPROACH TO THE STUDY OF A CURVED SHOCK-WAVE,
by M. M. Oberai. Jun 65, 16p
Grant NsG237
NASA TN-D-2858
Unclassified report

Descriptors: (*Shock waves, Kinetic theory).

N65-26650 Field 1B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
SOME NONASYMPTOTIC EFFECTS ON THE SONIC BOOM OF LARGE AIRPLANES,
by F. Edward McLean. Jun 65, 18p
NASA-TN-D-2877
Unclassified report

Descriptors: (*Sonic boom, Mathematical models).

N65-27349 Field 1A
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
EQUILIBRIUM HYDRODYNAMIC VARIABLES BEHIND THE PRIMARY AND REFLECTED SHOCK WAVES IN ARGON AND NITROGEN,
by Norman T. Grier. Jul 65, 51p NASA-TN-D-2905
Unclassified report

Descriptors: (*Argon, Shock waves), (*Nitrogen, Shock waves), (*Shock waves, Fluid dynamic properties).

N65-28639 Field 1A, 21I
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
HEAT-TRANSFER AND PRESSURE DROP CORRELATIONS FOR HYDROGEN AND NITROGEN FLOWING THROUGH TUNGSTEN WIRE MESH AT TEMPERATURES TO 5200 R,
by Byron L. Siegel, William L. Maag, Jack G. Slaby, and William F. Mattson. Jul 65, 27p NASA-TN-D-2924
Unclassified report

Descriptors: (*Gas flow, Gaseous rocket propellants), (*Tungsten, Heating elements), (*Gaseous rocket propellants, Convection), Friction, Hydrogen, Nitrogen, Heat transfer, Pressure.

N65-28855 Field 1C
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautical and Space Administration, Langley Station, Va. Langley Research Center.
SEPARATION TESTS OF ROCKET-PROPELLED MODELS OF A PILOT-ESCAPE CAPSULE,
by James A. Hollinger. Jul 65, 51p
NASA-TN-D-2901
Unclassified report

Descriptors: (*Jettisonable cockpits, Flight testing).

PB-168 324 Field 1A
CFSTI Prices: HC$3.00 MF$0.50

Army Ballistic Missile Agency, Redstone Arsenal, Ala. Development Operations Div.

RESULTS OF THE COMPUTATIONS OF SUPERSONIC FLOW FIELDS AFT OF CIRCULAR CYLINDRICAL BODIES OF REVOLUTION BY THE METHOD OF CHARACTERISTICS,
by Joseph L. Sims. 17 Mar 58, 57p
Rept. no. DA-R-49
AD 160 271

Unclassified report

Descriptors: (*Supersonic flow, Cylindrical bodies), (*Cylindrical bodies, Wake), (*Bodies of revolution, Supersonic characteristics), Pressure, Aerodynamic loading, Base flow, Graphics, Mathematical analysis.

A large number of computations were made by the method of characteristics of the flow field aft of the base of a half-infinite right circular cylinder at supersonic Mach numbers. These calculations are to be used in the estimation of the base pressure on a body of revolution in the presence of a propulsive jet. The characteristics of the bounding free streamline of all the flow fields calculated are presented in a series of graphs. Values that are presented are the geometric location of the free streamlines, the flow direction angle of the free streamline, and the Mach number of the free streamline. (Author)

SC-RR-64-2141 Field 1A
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
DRAG COEFFICIENTS AND HEATING RATIOS FOR RIGHT CIRCULAR CYLINDERS IN FREE-MOLECULAR AND CONTINUUM FLOW FROM MACH 10 TO 30,
by Robert D. Klett. Dec 64, 37p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Aerodynamic heating, Cylindrical bodies), (*Drag, Cylindrical bodies).

TID-21661 Field 1C, 17I, 4B
CFSTI Prices: HC$4.00 MF$1.00

Weather Bureau Research Station, Las Vegas, Nev.
LONG RANGE BALLOON TRACKING.
Final rept.,
by John Chisholm and Norman Kennedy. Sep 64, 115p
Contract AT(26-1)-114

Unclassified report

Descriptors: (*Balloons, Tracking).

02. Agriculture

ORNL-TM-1016 Field 2A, 13H
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
TRIP REPORT: TVA FERTILIZER PLANT AT MUSCLE SHOALS, WILSON DAM, ALA.,
by R. E. Blanco, H. W. Godbee, and J. M. Holmes.
9 Dec 64, 13p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Fertilizers, Manufacturing methods), (*Industrial plants, Fertilizers).

03. Astronomy and Astrophysics

N65-20825 Field 3B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
C2 SWAN BANDS IN COMETS,
by Ralph E. Stockhausen and Donald E. Osterbrock.
Aug 64, 16p NASA-TM-X-55130

Unclassified report

Prepared in cooperation with Washburn Observatory, Madison, Wis.

Descriptors: (*Comets, Band spectrum), (*Band spectrum, Carbon), Fluorescence.

N65-26413 Field 3B, 20M
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
EFFECT ON METEOR FLIGHT OF COOLING BY RADIATION AND ABLATION,
by H. Julian Allen, Barrett S. Baldwin, Jr., and Nataline A. James. Jun 65, 61p NASA-TN-D-2872

Unclassified report

Descriptors: (*Meteors, Heat transfer), (*Heat transfer, Meteors).

N65-28631 Field 3A
CFSTI Prices: HC$2.00 MF$0.50

GCA Corp., Bedford, Mass.
SOME ASPECTS OF THE ATMOSPHERIC CIRCULATION ON MARS,
by Wen Tang. Jul 65, 43p
Contract NASw975
NASA CR-262

Unclassified report

Descriptors: (*Planetary atmospheres, Mars), (*Mars, Planetary atmospheres).

N65-28674 Field 3B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
CONVECTIVE HEAT TRANSFER IN PLANETARY GASES,
by Joseph G. Marvin and George S. Deiwert.
Jul 65, 47p NASA-TR-R-224

Unclassified report

Descriptors: (*Heat transfer, Planetary gases), (*Planetary gases, Heat transfer).

SC-RR-64-967 Field 3B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
THE THEORY OF TYPE I COMET TAILS,
by David B. Beard. Aug 64, 11p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Astrophysics, Comets), (*Comets), (*Comets, Gas ionization).

04. Atmospheric Sciences

COO-1370-1 Field 4B
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor. Coll. of Engineering.
RAIN SCAVENGING STUDIES: DATA COLLECTION AND SYNTHESIS.
Final rept.,
by Nelson A. Dingle and Donald F. Gatz. Dec 64, 20p
Contract AT(11-1)-1370, Proj. ORA-06388
Unclassified report

Descriptors: (*Rainfall, Measurement), (*Meteorological instruments, Rainfall).

N65-16346 Field 4A, 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
NEW KNOWLEDGE OF THE EARTH'S ATMOSPHERE FROM THE AERONOMY SATELLITE (EXPLORER XVII),
by N. W. Spencer, G. P. Newton, C. A. Reber, L. H. Brace, and R. Horowitz. May 64, 33p
NASA-TM-X-54989, X-651-64-114 Unclassified report
Prepared for presentation to the International Space Science Symposium (5th), Florence (Italy) May 64.

Descriptors: (*Atmosphere, Physics), (*Meteorological satellites, Atmosphere), Data.

N65-16927 Field 4B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
RADIOSONDE AUTOMATIC DATA PROCESSING SYSTEM,
by Robert E. Turner and Richard A. Jendrek.
22 Dec 64, 27p NASA-TM-X-53186 Unclassified report
Prepared in cooperation with the Bendix Corp.

Descriptors: (*Data processing systems, Radiosondes), (*Radiosondes, Data processing systems), Meteorological instruments, Automatic.

N65-17611 Field 4A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
STABILITY CONDITIONS OF THE LOWER ATMOSPHERE AND THEIR IMPLICATIONS REGARDING DIFFUSION AT CAPE KENNEDY, FLORIDA,
by James R. Scoggins and Margaret B. Alexander.
3 Sep 64, 34p NASA-TM-X-53132
Unclassified report

Descriptors: (*Atmosphere, Florida), (*Diffusion, Atmosphere), Stability, Military facilities.

N65-26600 Field 4A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
THE MAGNETOSPHERE AND ITS BOUNDARY,
by Tatsuzo Obayashi. Jun 65, 7p Unclassified report
NASA-TN-D-2789
Descriptors: (*Upper atmosphere, Terrestrial magnetism), (*Terrestrial magnetism, Upper atmosphere).

N65-27815 Field 4A, 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
DETERMINATION OF MEAN ATMOSPHERIC DENSITIES FROM THE EXPLORER IX SATELLITE,
by Gerald M. Keating, James A. Mullins, Claude W. Coffee, and David S. McDougal. Jul 65, 33p
NASA-TN-D-2895
Unclassified report

Descriptors: (*Atmospheric sounding, Satellites-(Artificial)), (*Satellites(Artificial), Atmospheric sounding).

N65-28633 Field 4A, 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
IONOSPHERE TOPSIDE SOUNDER STUDIES. I. THE REDUCTION OF ALOUETTE I IONOGRAMS TO ELECTRON DENSITY PROFILES,
by J. O. Thomas, B. R. Briggs, L. Colin, M. J. Rycroft, and Margaret Covert. Jul 65, 47p NASA-TN-D-2882
Unclassified report

Descriptors: (*Atmospheric sounding, Satellites-(Artificial)), (*Electron density, Ionosphere), Programming(Computers).

N65-28637 Field 4A, 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
IONOSPHERE TOPSIDE SOUNDER STUDIES. II. THE CALCULATION OF THE ELECTRON DENSITY AND THE MAGNETIC FIELD PARAMETERS AT THE ALOUETTE I ORBIT,
by J. O. Thomas, M. J. Rycroft, Margaret Covert, B. R. Briggs and L. Colin. Jul 65, 16p
NASA-TN-D-2921 Unclassified report
Descriptors: (*Atmospheric sounding, Satellites-(Artificial)), (*Satellites(Artificial), Atmospheric sounding).

PB-167 975 Field 4B, 4A
CFSTI Prices: HC$4.00 MF$1.00

Chicago Univ., Ill. Cloud Physics Lab.
COLLECTION OF REPRINTS IX,
by Bernice Ackerman, Horace R. Byers, Yoshiaki Toba, Roscoe R. Braham, Jr., and Edward N. Brown. 1 Jun 65, 122p Unclassified report
Technical note TN-30
Sponsored by National Science Foundation and U. S. Weather Bureau.

Descriptors: (*Meteorology, Bibliographies), Tropical cyclones, Water, Rainfall, Ice, Meteorological radar, Radar echo areas, Storms, Clouds, Aerosols, Marine meteorology, Snow, Atmosphere.

Contents: Liquid Water Contents in Hurricanes; What is the hole in summer rain-showers; Observations of the micro-structure of a radar bright band and associated shower; Severe local storms: In retrospect; Role of condensed water in the life cycle of a convective cloud; On the giant sea-salt particles in the atmosphere I. General features of the distribution; The aerial observation of snow and rain clouds; Identification of ice nuclei in the atmosphere; Global aspects of the production and distribution of giant sea-salt particles.

05. Behavioral and Social Sciences

AD-412 488 Field 5C, 5K
CFSTI Prices: HC$2.00

RAND Corp., Santa Monica, Calif.
RECENT LAND-USE TRENDS IN FORTH-EIGHT LARGE AMERICAN CITIES,
by John H. Niedercorn and Edward F. R. Hearle.
Sep 63, 42p Memo no. RM-3664-1-FF
Unclassified report

Descriptors: (*Urban areas, Economics), Population, Data, Urban planning.

An examination of changes in the proportions of various types of land in urban use shows that vacant land in the larger American cities is rapidly disappearing. Net land-use densities are declining for population and manufacturing employment; commercial employment densities appear to be approximately constant. Consequently, unless large amounts of vacant land exist inside the city limits, the average large city appears to have nearly reached its upper limits of population and employment in manufacturing and commerce. A full set of the land-use, population, and employment data utilized in the analytical part of this paper are included in the appendixes. The land-use data were collected from the city planning commissions of 48 cities, and both employment and population data are estimates made by the authors. To their knowledge this is the most complete set of city land-use, population, and employment data available in a single publication. Consequently, this Memorandum should be of considerable interest to city planners, regional scientists, and others interested in urban problems. (Author)

AD-416 803 Field 5B
CFSTI Price: HC$3.00

System Development Corp., Santa Monica, Calif.
RESEARCH BASES OF LANGUAGE DATA PROCESSING SYSTEM DESIGN,
by R. V. Katter. 17 Jun 63, 55p
Technical memo. no. TM-1199
Unclassified report

Descriptors: (*Information retrieval, Design), Subject indexing, Reviews, Abstracting, Classification, Language.

The major problems other than that of hardware in the design of information retrieval systems are reviewed as they are treated in the literature. The rate-capacity planning problem: That of accurately anticipating the over-all magnitudes of filtering, processing, storing, and service request handling activities that will be demanded of the system in the future. The key to solving a system's rate-capacity planning problems is to find means of accurately predicting the future rate requirements. The accessibility allocation problem: That of assigning different degrees of user accessibility to items of material considered for storage in the system. It is reasonable to assume that an information retrieval system (or a national composite of such systems) will always have limited resources to keep items accessible. An effort must be made to try to predict how many requesters will want each item, when, and how important will be the needs. The system-requester transaction problem: That of improving the results of the interaction process between system and requester by which the requester's current need for materials is defined in terms which the system can use for searching. The research efforts here have two broad focuses. The first centers around improving 'meta-arrangements' like indexing, classification, and abstracting systems which are used to create condensed representations of the items in store. The second focus is on the development of adequate theories of structure for modern written languages.

IDO-17074 Field 5I
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
FIELD EVALUATION AND CONTROL OF PERSONNEL BEHAVIOR,
by R. J. Nertney. Apr 65, 29p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Personnel management, Control systems), (*Management control systems, Personnel).

PB-168 099 Field 5F, 5B

Bureau of the Census, Washington, D. C. Foreign Demographic Analysis Div.
BIBLIOGRAPHY OF SOCIAL SCIENCE PERIODICALS AND MONOGRAPH SERIES: JAPAN, 1950-1963.
FOREIGN SOCIAL SCIENCE BIBLIOGRAPHIES SERIES P-92, NO. 20.
1965, 352p
Unclassified report

Available from Superintendent of Documents, GPO, Washington, D. C., 20402, HC$1.75 as C3.163/5:20.
Available from CFSTI MF$1.75.

Descriptors: (*Japan, Social sciences), (*Social sciences, Bibliographies), Periodicals, Anthropology, Economics, Education, History, Population, Law, Language, Political science, Public health, Social psychology, Sociology, Statistical analysis.

PB-168 229 Field 5J
CFSTI Prices: HC$6.00 MF$1.50

Tulane Univ., New Orleans, La. School of Medicine.
ERDL-TULANE SYMPOSIUM ON FLICKER, JUNG HOTEL, NEW ORLEANS, LOUISIANA, APRIL 6, 1957,
ed. by L. M. N. Bach. 1958, 261p
Contract DA44 009eng2448, Proj. 8 18 06 003
AD 155 440
Unclassified report

Descriptors: (*Visual perception, Light), (*Light, Reaction(Psychology)), (*Motor reactions, Light), Intensity, Stimulation, Verbal behavior, Stroboscopes, Adaptation(Physiology), Perception(Psychology), Interference, Emotions, Auditory perception, Retina, Electroencephalography, Sleep.

The report is concerned with the results of a systematic investigation of some of the variables of flickering light which influence the production of certain specific types of sensations. While subjective responses are not always as reliable or as susceptible to analysis as are more objective measurements, it was necessary to rely on the use of subjective reports in some cases in order to get a measure of the types of effects produced. While interest was primarily centered on the effects of flickering light on consciousness for both theoretical and practical reasons, data relating to other effects produced by flickering light (i.e., stroboscopic effects) were also collected.

PB-168 263 Field 5J
CFSTI Prices: HC$7.00 MF$1.75

American Psychological Association, Inc., Washington, D. C.
PROCEEDINGS OF THE ANNUAL CONVENTION OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION (73rd), 1965.
1965, 387p
Grant NSF GN281

Unclassified report

Contributed Papers Selected by the 1965 Program Committees of the Divisions of Experimental, Physiological, Clinical, Educational, and Counseling Psychology.

Descriptors: (*Psychology, Symposia), Conditioned reflex, Decision making, Learning, Behavior, Verbal behavior, Memory, Social psychology, Psychometrics, Personality.

PB-168 269 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 21 of Quarterly progress rept. no. 60,
by R. Jakobson, A. N. Chomsky, M. Halle, R. H. Abernathy, and G. H. Matthews. 15 Jan 61, 14p

Unclassified report

Also available as p199-212 of Quarterly progress rept. no. 60.

Descriptors: (*Language, Analysis), Automata.

LANGUAGE-GENERATING DEVICES, by R. J. Parikh: Properties of context-free (CF) grammars are investigated, particularly questions regarding structure, possible ambiquities, and relationship to finite automata. The following results are presented: (1) The language generated by a context-free grammar is linear in a sense that will be defined precisely. (2) The requirement of unambiguity - that every sentence has a unique phrase structure - weakens the grammar in the sense that there exists a CF language that cannot be generated unambiguously by a CF grammar. (3) The result that not every CF language is a finite automaton language is shown to be improved. (4) A type of grammar is defined that is intermediate between a context grammar and a CF grammar.

PB-168 270 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 25 of Quarterly progress rept. no. 64,
by R. Jakobson, A. N. Chomsky, M. Halle, L. M. Kampf, and A. L. Lipson. 15 Jan 62, 8p
Grants NSF G7364, NSF G13903

Unclassified report

Also available as p231-238 of Quarterly progress rept. no. 64, AD-273 075 and TID-15140.

Descriptors: (*Language, Analysis).

ON THE LIMITATIONS OF CONTEXT-FREE PHRASE-STRUCTURE DESCRIPTION, by P. M. Postal: The Mohawk language, one of the 5 living Northern Iroquoian languages, is shown not to be a context-free language, i.e. it is impossible to construct a finite set of context-free rules that will enumerate all, and only, Mohawk sentences. Mohawk is demonstrated to lie outside the bounds of context-free description by an illustration that it contains, as a subpart, an infinite set of sentences with the formal properties of the language /XX/, where X is a variable over strings of arbitrary length.

PB-168 272 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 27 of quarterly progress rept. no. 65,
by R. Jakobson, A. N. Chomsky, M. Halle, L. M. Kampf, and A. L. Lipson. 15 Apr 62, 11p
Grants NSF G7364, NSF G13903

Unclassified report

Also available as p187-197 of Quarterly progress rept. no. 65, AD-275 765 and TID-15642.

Descriptors: (*Language, Analysis), Automata, Information retrieval, Computer storage devices.

CONTEXT-FREE GRAMMARS AND PUSHDOWN STORAGE, by A. N. Chomsky. An automaton is considered with 2 infinite tapes blocked off into squares, each of which can contain a symbol one an input tape, the other a storage tape. The automaton can behave so as to be called a pushdown storage automaton and is a special case of a linear bounded automaton. The theory of such an automaton is shown to have essentially the same limitations as the theory of context free grammar. INSEPARABLE PREFIXES OF GERMAN VERBS, by J. J. Viertel.

PB-168 274 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 18 of Quarterly progress rept. no. 66,
by R. Jakobson, A. N. Chomsky, M. Halle, L. M. Kampf, and A. L. Lipson. 15 Jul 62, 3p
Grants NSF G13903, NIH MHO4737 02

Unclassified report

Also available as p295-297 of Quarterly progress rept. no. 66.

Descriptors: (*Language, Analysis), USSR.

DESCRIPTIVE CONVENTION FOR TREATING ASSIMILATION AND DISSIMILATION, by M. Halle: Assimilation and dissimilation are phonetic processes in a language that determine the value of a feature with reference to the value of the same feature in some adjacent structure. Conventions are devised for instances where (1) voicelessness and voicing in obstruent clusters are determined by the value of the feature in the last segment in the sequence and (2) a language has no glides and all words are of the consonant-vowel-consonant-vowel structure. The conventions are applied to (1) those Slavic languages where /e/ yields /ae/ and /o/ yields /u/ in the environment before nasal consonants and (2) the case where segment S1 is replaced by another segment S2 which in turn is replaced by S1. PROTO-SLAVIC DIPHTHONGS, by M. Halle: The 4 proto-Slavic vowels i, u, e, and o are treated where sequences consisting of a nondiffuse vowel are followed by a diffuse vowel. A rule is devised for the assimilation and diffuseness of the second vowel by the first in all diphthongs except oi.

PB-168 276 Field 5G
CFSTI Prices: HC$1.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 14 of Quarterly progress rept. no. 67,
by R. Jakobson, A. N. Chomsky, M. Halle, L. M. Kampf, and A. L. Lipson. 15 Oct 62, 5p
Grants NSF G13903, NIH MH04737 02
Unclassified report

Also available as p177-180 of Quarterly progress rept. no. 67.

Descriptors: (*Language, Analysis), USSR.

PB-168 277 Field 5G
CFSTI Prices: HC$2.00 MF$0.50

Research Lab. of Electronics, Mass. Inst. of Tech., Cambridge.
LINGUISTICS.
Pt. 12 of Quarterly progress rept. no. 63,
by R. Jacobson, A. N. Chomsky, M. Halle, G. H. Matthews, and L. M. Kampf. 15 Oct 61, 31p
Unclassified report

Also available as p139-69 of Quarterly progress rept. no. 63, AD-267 387.

Descriptors: (*Language, Analysis), USSR.

DETERMINERS, by Carlota M. Smith: A discussion is given of restrictive and appositive relative clauses with respect to determiners under the assumption that relative clauses are adjoined to the determiner of a noun clause. NOTE ON CYCLICALLY ORDERED RULES IN THE RUSSIAN CONJUGATION, by M. Halle. SOME REMARKS ON CHOMSKY'S CONTEXT-FREE LANGUAGES, by M. P. Schutzenberger: An examination is made of families of subsets of a free monoid that arise naturally when generating difinitions of classical analysis to the noncommutative case.

PB-168 279 Field 5J, 5B, 9B
CFSTI Prices: HC$1.00 MF$0.50

System Development Corp., Santa Monica, Calif.
AUTOMATED CONTENT ANALYSIS,
by John D. Ford, Jr. 18 Feb 63, 12p
Technical memo. no. TM-904
Unclassified report

See also AD-420 518.

Descriptors: (*Psychiatry, Data processing systems), (*Data processing systems, Psychiatry), Abstracting, Subject indexing, Programming(Computers), Training, Behavior, Supervisory personnel.

Automated content analysis is defined as the use of computer programs to detect and select content themes in sentence-by-sentence scanning of text or verbal protocols. The problem of processing information contained in natural language form is raised. Manual techniques for content analysis of psychotherapy protocols and group-meeting protocols have occupied the attention of psychologists for a long time. Recent developments in computer processing of natural language indicate that automated content analysis is an obtainable goal. It is proposed to develop computer programs to detect and extract content themes from protocols of supervisory training meetings. Later attempts will be made to develop automated social-interaction analysis. The initial work on the project is described. (Author)

PB-168 283 Field 5J, 5I, 9B
CFSTI Prices: HC$1.00 MF$0.50

System Development Corp., Santa Monica, Calif.
THE USE OF AUTOMATED CONTENT ANALYSIS IN PREDICTING BEHAVIOR OF SUPERVISORY TRAINING GROUPS,
by John D. Ford, Jr. 1 May 63, 13p Unclassified report
Technical memo. no. RM-1225

Descriptors: (*Psychometrics, Data processing systems), (*Supervisory personnel, Training), Social psychology, Group dynamics, Behavior, Personality, Verbal behavior, Perception(Psychology), Reasoning, Leadership, Punched cards, Programming(Computers).

Emphasis is placed on the development of automated content analysis techniques sufficiently sophisticated to apply to relatively complex theories of personality and social interaction behavior. As a beginning, the Myers-Briggs Type Indicator is used as a basis for dividing members of a supervisory training group into dichotomies along each of the four dimensions of the indicator. Predictions are made about the selection of content themes in the written reports of the group members. Automated content analysis together with a manual analysis of the content themes are made to test the predictions.

PB-168 322 Field 5D

Columbia Univ., New York.
LEGAL ASPECTS OF ARMS CONTROL VERIFICATION IN THE UNITED STATES,
by Dennis S. Aronowitz. 1965, 280p Unclassified report
For Announcement only.
Prepared as an Independent Research Project under the Auspices of the Legislative Drafting Research Fund of Columbia Univ.

Descriptors: (*Arms control, Law), United States Government, Disarmament, Foreign policy, Air transportation, Merchant vessels, Cargo vehicles, Communication systems, Hospitals, Industries, Storage, Aerial reconnaissance, Satellites(Artificial).

The study, sponsored by the United States Arms Control and Disarmament Agency, explores the problems which verification of assumed arms control measures might raise under American law. The principal objective is to identify and analyze limitations under existing law which might impede inspection to verify compliance in the United States. The report examines also whether and by what means such legal impediments might be eliminated or mitigated. Treaty provisions which will meet domestic legal problems, as well as domestic legislation for implementing particular verification procedures are suggested. The status, rights and facilities inspectors may require are considered, and the possible abuses of the inspection process -- in particular the procedures for compensating those who suffer damage from inspection--are discussed.

06. Biological and Medical Sciences

ACRH-23 Field 6E
CFSTI Prices: HC$5.00 MF$1.00

Argonne Cancer Research Hospital, Chicago, Ill.
SEMIANNUAL REPORT TO THE ATOMIC ENERGY COMMISSION,
ed. by Leon O. Jacobson. Mar 65, 178p
Contract AT(11-1)-69 Unclassified report

Descriptors: (*Cancer, Medical research), (*Medical research, Cancer).

AD-281 597 Field 6E, 20M
CFSTI Price: HC$3.00

Lockheed Missiles and Space Co., Sunnyvale, Calif.
RESEARCH STUDY OF THE PRODUCTION OF RETINAL BURNS.
Final technical rept.,
by H. W. Rose, H. N. Ritland, and George Werth.
Oct 61, 95p Rept. no. 2-30-61-1
Contract DA49 146XZ046
DASA 1279
Descriptors: (*Retina, Burns), Thermal radiation, Eye, Nuclear explosions, Absorption spectrum, Absorption(Biological), Tissues(Biology), Damage, Thresholds(Physiology), Lasers, Scattering, Rabbits, Humans.

The spectral transmission of the chorioidal and the pigment epithelium is determined in rabbit and human eyes. The threshold for chorioretinal lesions is determined with a laser. The attenuation of radiation in four model atmospheres is discussed. Formulae and computation methods are developed for the computation of the risk of chorioretinal lesions from atomic fireballs, depending on yield, atmosphere range, and absorption in eye tissues. (Author)

BNL-898 Field 6P
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE GASES OF THE BLOOD,
by Donald D. Van Slyke. 18 Nov 64, 18p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Blood, Gases), (*Gases, Blood).

BNL-908 Field 6R
CFSTI Prices: HC$5.00 MF$1.25

Brookhaven National Lab., Upton, N. Y.
MEDICAL SURVEY OF THE PEOPLE OF RONGELAP AND UTIRIK ISLANDS NINE AND TEN YEARS AFTER EXPOSURE TO FALLOUT RADIATION (MARCH 1963 AND MARCH 1964),
by Robert A. Conrad, Leo M. Meyer, Wataru M. Sutow, Austin Lowrey, and Alvin C. Watne. May 65, 174p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Radioactive fallout, Public health), (*Radiation effects, Radioactive fallout).

BNL-7725 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE INFLUENCE OF SUCROSE CONCENTRATION ON THE MINIMUM MITOTIC CYCLE DURATION OF ROOT MERISTEM CELLS IN VITRO. Unclassified report
Rept. on Sucrose and Mitotic Cycle Duration,
by Jack Vant Hof. 1962, 13p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Sucrose, Mitosis), (*Mitosis, Plants-(Botany)).

BNL-7727 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE DESIGN AND CALIBRATION OF AN X-RAY BEAM FACILITY FOR RADIOBIOLOGIC STUDIES ON MAMMALIAN NERVOUS TISSUES.
Rept. on X-ray facility for neural studies,
by Arland L. Carsten and W. Zeman. 1963, 19p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Radiobiology, Nerves), (*Nerves, Radiobiology), Medical equipment.

BNL-7780 Field 6A, 7C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE FORMATION OF COLLAGEN HYDROXYLYSINE STUDIED WITH TRITTATED LYSINE.
Report on formation of hydroxylysine,
by Edwin A. Popenoe, Robert B. Aronson and Donald D. Van Slyke. 1963, 20p Unclassified report
Contract AT(30-2)-GEN-16
Descriptors: (*Collagen, Amino acids), (*Amino acids, Biosynthesis).

BNL-7803 Field 6A
CFSTI Prices: HC$4.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
THE CHEMISTRY OF PEPTIDES AND PROTEINS,
by C. H. W. Hirs. 1963, 105p Unclassified report
Contract AT(30-2)-GEN-16
Descriptors: (*Peptides, Chemical analysis), (*Proteins, Chemical analysis).

BNL-7815 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
NINE SHORT ARTICLES ON STUDIES OF ZEA MAYS,
by H. H. Smith. 1963, 25p Unclassified report
Contract AT(30-2)-GEN-16
Descriptors: (*Corn, Genetics).

BNL-7837 Field 6R, 6F
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE AUTUMNAL SEED RAIN IN AN IRRADIATED FOREST,
by Richard H. Wagner. 1963, 12p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Seeds, Radiation effects), (*Radiobiology, Seeds).

BNL-7898 Field 6C, 6A
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
DISCREPANCIES IN MITOTIC CYCLE TIME WHEN MEASURED BY TRITIATED THYMIDINE AND COLCHICINE. THE EFFECT OF TRITIATED THYMIDINE ON THE G 1 PERIOD DURATION,
by J. Vant Hof. 1963, 17p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Mitosis, Tracer studies), (*Autoradiography, Mitosis).

BNL-7900 Field 6C, 6A
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE MECHANISM OF 5-AMINOURACIL INDUCED SYNCHRONY OF CELL DIVISION IN VICIA FABA ROOT MERISTEMS,
by Wolf Prensky and Harold H. Smith. 1963, 37p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Nucleotides, Cell division).

BNL-7901 Field 6C, 4B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE PRODUCTIVITY OF NATURAL COMMUNITIES. I. AN AUTOMATIC DATA RECORDING SYSTEM FOR MONITORING METABOLISM AND MECROCLIMATE IN THE FIELD,
by G. M. Woodwell, F. R. Becherer, and E. B. Hadley. 1964, 30p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Metabolism, Data processing systems), (*Micrometeorology, Data processing systems).

BNL-7909 Field 6M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
GENETIC MAP OF SALMONELLA TYPHIMURIUM,
by Kenneth E. Sanderson and H. Demarec. 1963, 6p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Salmonella, Genetics).

BNL-7936 Field 6A, 9B
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A DIGITAL PROCEDURE FOR THE COMPUTATION OF AMINO ACID ANALYZER DATA.
Rept. on amino acid analysis computation,
by A. Yonda, D. L. Filmer, C. H. W. Hirs, H. Pate, and N. Alonzo. 1964, 38p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Amino acids, Data processing systems).

BNL-7944 Field 6A, 6P
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
INHIBITION BY INSULIN OF HEPATIC GLUCOSE PRODUCTION IN THE NORMAL DOG,
by R. Steel, J. S. Bishop, A. Dunn, R. C. de Bodo, and I. Rathgeb. 1964, 22p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Insulin, Hypoglycemia), (*Glucose, Biosynthesis).

BNL-7955 Field 6P
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
GRANULOCYTOPOIESIS,
by E. P. Cronkite and T. M. Fliedner. 1964, 43p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Hemopoietic system, Leukocytes), (*Leukocytes, Hemopoietic systems).

BNL-7961 Field 6E
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
FORMULATION OF A COMPARTMENTAL MODEL IN A STUDY OF PARTIAL PARATHYROID DEFICIENCY,
by S. H. Cohn, S. Bozzo, N. Glatstein, E. A. Gusmand, and J. Litvak. 1963, 26p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Parathyroid glands, Deficiency diseases).

BNL-8053 Field 6P
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
EFFECT OF OVARIAN HORMONES ON DURATION OF DNA SYNTHESIS IN CELLS OF THE C3H MOUSE MAMMARY GLAND,
by Francesco Bresciani. 1963, 40p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Progesterone, Desoxyribonucleic acids), (*Desoxyribonucleic acids, Mammary glands).

BNL-8892 Field 6R, 18B, 6C
CFSTI Prices: HC$3.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
RESEARCH USES OF THE GAMMA FIELD AND RELATED RADIATION FACILITIES AT BROOKHAVEN NATIONAL LABORATORY,
by Arnold H. Sparrow. 1965, 58p CONF-800-3
Contract AT(30-2)-GEN-16
Unclassified report

Presented at Japan Conference on Radioisotopes (No. 6) Tokyo, Japan 17 Nov 64.

Descriptors: (*Radioactive isotopes, Symposia), (*Radiation effects, Plants(Botany)).

BNL-8934 Field 6M
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
GENE DIFFERENTIATION,
by M. Demerec. 1964, 8p CONF-734-5
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the Symposium on Genes and Chromosomes Structure and Function, Buenos Aires, Nov-Dec 64.

Descriptors: (*Genetics, Enterobacteriaceae), (*Enterobacteriaceae, Genetics).

CONF-801-3 Field 6R, 6C
CFSTI Prices: HC$1.00 MF$0.50

Michigan State Univ., East Lansing. Dept. of Biophysics.
FACTORS WHICH MAY INFLUENCE CELLULAR RADIOSENSITIVITY,
by Leroy Augenstein. 1964, 19p
Contract AT(11-1)-1155
Unclassified report

Presented at the Panel on the Molecular Basis of Radiosensitivity, Vienna, Austria 16-20 Nov 64.

Descriptors: (*Radiation effects, Cells(Biology)), (*Cells(Biology), Radiation effects).

CONF-630803-1 Field 6A
CFSTI Prices: HC$1.00 MF$0.50

Milan Univ. (Italy). Istituto di Farmacologie e di Terapia.
INVESTIGATIONS ON THE EARLY EFFECTS OF CCL4 ON LIPID TRANSPORT,
by M. Poggi, R. Fumagalli, A. Sabatini-Pellegrini, and R. Paoletti. 1963, 17p
Contract AT(30-1)-3097
Unclassified report

Presented at the International Pharmacological Meeting, (No. 2) Prague. Aug 63.

Descriptors: (*Carbon tetrachloride, Lipids), (*Lipids, Carbon tetrachloride).

CONF-641207-5 Field 6R, 6J
CFSTI Prices: HC$1.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
REGULATIONS AND CONTROL FOR RADIATION PROTECTION.
Paper no. 64-819,
by Milo D. Voss. Dec 64, 19p
Contract W-7405-eng-42
Unclassified report

Presented at the American Society of Agricultural Engineers, winter meeting, New Orleans, La. 8-11 Dec 64.

Descriptors: (*Industrial medicine, Radioprotective agents), (*Radioprotective agents, Industrial medicine).

COO-875-27 Field 6A
CFSTI Prices: HC$4.00 MF$0.75

Utah Univ., Salt Lake City.
QUANTUM YIELD STUDIES OF THE PHOTODYNAMIC INACTIVATION OF TRYPSIN,
by Blaine W. Glad and John D. Spikes. Jun 64, 113p
Contract AT(11-1)-875
Unclassified report

Descriptors: (*Trypsin, Photosensitivity(Biological)), (*Biochemistry, Trypsin).

COO-888-42 Field 6C
CFSTI Prices: HC$3.00 MF$1.00

Michigan State Univ., East Lansing.
INFLUENCE OF ROOT TEMPERATURE ON THE ABSORPTION OF FOLIAR APPLIED RADIOPHOSPHORUS AND RADIOCALCIUM.
Doctoral thesis,
by Richard L. Phillips. 1964, 128p Unclassified report
Contract AT(11-1)-888

Descriptors: (*Absorption(Biological), Tracer studies), (*Plants(Botany), Absorption(Biological)).

COO-1095-3 Field 6R, 6M
CFSTI Prices: HC$4.00 MF$0.75

Michigan Univ., Ann Arbor. Coll. of Engineering.
A STUDY OF THE EFFECT OF IONIZING RADIATION ON RESISTANCE, GERMINATION, AND TOXIN SYNTHESIS OF CLOSTRIDIUM BOTULINUM SPORES, TYPES A, B, AND E.
Final rept.,
by J. T. Graikoski and L. L. Kempe. Dec 64, 115p
Contract AT(11-1)-1095, Proj. ORA-04811
Unclassified report

Descriptors: (*Radiation effects, Clostridium botulinum), (*Clostridium botulinum, Radiation effects).

GAT-450 Field 6R, 6J
CFSTI Prices: HC$1.00 MF$0.50

Goodyear Atomic Corp., Piketon, Ohio.
ENVIRONMENTAL RADIATION LEVELS AND CONCENTRATIONS, 1964.
Second half, and annual summary,
by B. Kalmon. 1 Mar 65, 15p
Contract AT(33-2)-1
Unclassified report

Descriptors: (*Industrial medicine, Radiation hazards), (*Radiation hazards, Industrial medicine).

IAEA-2616 Field 6M
CFSTI Prices: HC$1.00 MF$0.50

Bergen Univ. (Norway). Dept. of Pharmacology.
PHOSPHATE METABOLISM OF ESCHERICHIA COLI.
Final rept. 2 Sep 61-14 May 64,
by Leiv Klungsoeyr. 1964, 6p Unclassified report
Contract IAEA 65/R1/US

Descriptors: (*Escherichia coli, Metabolism), (*Metabolism, Phosphates).

LF-21 Field 6P, 6J, 6T
CFSTI Prices: HC$0.50 MF$0.50

Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
TRANSPORT OF RELATIVELY INSOLUBLE MATERIALS FROM LUNG TO LYMPH NODES,
by R. G. Thomas. Jan 65, 18p
Contract AT(29-2)-1013
Unclassified report

Descriptors: (*Lungs, Transport properties), (*Toxicity, Industrial medicine).

LF-25 Field 6M
CFSTI Prices: HC$1.00 MF$0.50

Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
EXPERIMENTAL INFECTION OF BEAGLES WITH ECHO VIRUS TYPE 6,
by F. F. Pindak and W. E. Clapper. May 65, 15p
Contract AT(29-2)-1013
Unclassified report

Descriptors: (*ECHO virus, Dogs).

N65-24039 Field 6S, 22A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Houston, Tex. Manned Spacecraft Center.
SURVIVAL AFTER DECOMPRESSION TO A VACUUM,
by John Billingham. 1964, 19p NASA-TM-X-51669
Unclassified report

Presented at Aerospace Med. Assoc., Miami, Fla., 11-14 May 1964.

Descriptors: (*Decompression sickness, Space medicine), (*Space medicine, Decompression sickness).

N65-28750 - N65-28777 Field 6P, 9B
CFSTI Prices: HC$4.50 MF$2.50

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
SYMPOSIUM ON THE ANALYSIS OF CENTRAL NERVOUS SYSTEM AND CARDIOVASCULAR DATA USING COMPUTER METHODS,
ed. by Lorne D. Proctor and W. Ross Adey. 1965, 484p NASA-SP-72
Unclassified report

Descriptors: (*Central nervous system, Data processing systems), (*Cardiovascular system, Data processing systems).

N65-28959 Field 6C, 20F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
A CRITICAL STUDY OF THE ABSORPTION OF POLYPEPTIDES IN THE FAR-ULTRAVIOLET AS A MEANS OF EXTRATERRESTRIAL LIFE DETECTION,
by Richard D. Johnson. Jul 65, 10p
NASA-TM-X-1131
Unclassified report

Descriptors: (*Peptides, Spectra(Visible + ultraviolet)), (*Space biology, Ultraviolet spectroscopy).

NYO-901-3 Field 6A, 6P
CFSTI Prices: HC$1.00 MF$0.50

New England Deaconess Hospital, Boston, Mass. Cancer Research Inst.
THE FORMS OF TRYPTOPHAN PYRROLASE IN LIVER.
by W. Eugene Knox. 1 Mar 65, 16p
CONF-641019-1
Contract AT(30-1)-901
Unclassified report

Presented at the Japanese Biochemical Society Meeting, Nagoya, Japan.

Descriptors: (*Tryptophan, Liver), (*Liver, Tryptophan).

NYO-1918-100 Field 6R, 6C
CFSTI Prices: HC$2.00 MF$0.50

Woods Hole Oceanographic Institution, Mass.
BIOLOGICAL, CHEMICAL AND RADIOCHEMICAL STUDIES OF MARINE PLANKTON.
Progress rept. for 1964,
by Bostwick H. Ketchum and John H. Ryther. 1 May 65, 43p
Contract AT(30-1)-1918
Unclassified report

Descriptors: (*Radiation effects, Plankton), (*Plankton, Radiation effects).

NYO-2564-1 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Catholic Univ. of America, Washington, D. C.
THE EFFECT OF IONIZING RADIATION ON THE METABOLISM OF STRAIN L.
Terminal rept. 1 May 60-31 Jul 64,
by Roland M. Nardone. 1964, 14p
Contract AT(30-1)-2564
Unclassified report

Descriptors: (*Radiation effects, Cells(Biology)), (*Metabolism, Radiation effects).

NYO-3105-1 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Dept. of Biology.
BIOCHEMISTRY OF GAMETOGENESIS AND FERTILIZATION IN ALGAE.
Final rept.,
by Raymond F. Jones. 29 Jan 65, 10p
Contract AT(30-1)-3105
Unclassified report

Descriptors: (*Algae, Reproduction (Physiology)).

ORNL-3820 Field 6R
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
APPLIED HEALTH PHYSICS ANNUAL REPORT FOR 1964.
Jun 65, 85p Unclassified report
Contract W-7405-eng-26
Descriptors: (*Health physics, Reports).

TID-20082 Field 6R, 6C
CFSTI Prices: HC$1.00 MF$0.50

Purdue Univ., Lafayette, Ind.
GENE NUMBER, EFFECT, AND MUTATION RATE FOR BODY WEIGHT IN TRIBOLIUM CASTANEUM,
by Alan C. Bartlett and Earl A. Bell. 1963, 7p
Contract AT(11-1)-965
Unclassified report

Descriptors: (*Radiation effects, Coleoptera), (*Coleoptera, Mutations).

TID-20442 Field 6R, 6C
CFSTI Prices: HC$2.00 MF$0.50

North Carolina Agricultural Experiment Station, Raleigh.
BREEDING VALUE OF THE RADIATION INDUCED MACROMUTANT. II. EFFECT OF MUTANT EXPRESSION AND ASSOCIATED BACKGROUNDS ON SELECTION POTENTIAL IN ARACHIS HYPOGAEA L.
by D. A. Emery, W. C. Gregory and P. J. Loesch, Jr. 1964, 29p
Contract AT(40-1)-1747
Unclassified report

Descriptors: (*Radiation effects, Mutations), (*Mutations, Radiation effects).

TID-21404 Field 6H, 6R
CFSTI Prices: HC$4.00 MF$1.00

Bureau of Commercial Fisheries, Seattle, Wash. Technological Lab.
APPLICATION OF RADIATION-PASTEURIZATION PROCESSES TO PACIFIC CRAB AND FLOUNDER.
Final summary rept. for Nov 63-Oct 64.
Nov 64, 124p
Contract AT(49-11)-2058

Unclassified report

Descriptors: (*Crustacea, Irradiated foods), (*Fishes, Irradiated foods).

TID-21493 Field 6R, 6A
CFSTI Prices: HC$1.00 MF$0.50

Milan Univ. (Italy). Istituto di Farmacologia e di Terapia.
EFFECTS OF IONIZING RADIATIONS ON THE CONTROL MECHANISMS OF LIPID TRAN SPORT.
Annual rept. no. 1, 1 Nov 62-31 Oct 63.
1963, 21p
Contract AT(30-1)-3097

Unclassified report

Descriptors: (*Radiation effects, Lipids), (*Lipids, Radiation effects).

TID-21496 Field 6R, 6A
CFSTI Prices: HC$1.00 MF$0.50

Milan Univ. (Italy). Istituto Di Farmacologia e di Terapia.
EFFECTS OF IONIZING RADIATIONS ON THE CONTROL MECHANISMS OF LIPID TRANSPORT.
Annual rept. no. 2, 1 Feb 64 - 31 Jan 65.
1965, 24p
Contract AT(30-1)-3097

Unclassified report

Descriptors: (*Radiation effects, Lipids), (*Lipids, Radiation effects).

TID-21544 Field 6C
CFSTI Prices: HC$1.00 MF$0.50

Duke Univ., Durham, N. C. School of Forestry.
DETERMINATION OF THE EXTENT OF ROOT DISTRIBUTION BY THE USE OF RADIOTRACER TECHNIQUES.
Final rept.
1 Jan 65, 12p
Contract AT(40-1)-2790

Unclassified report

Descriptors: (*Plants(Botany), Tracer studies).

TID-21604 Field 6R, 6C
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Univ., Amherst.
COMPREHENSIVE FINAL REPORT OF RESEARCH ACTIVITIES, 1958 - 1963.
by Otto L. Stein. 1963, 43p
Contract AT(45-1)-1302

Unclassified report

Descriptors: (*Radiation effects, Plants(Botany)), (*Plants(Botany), Radiation effects).

TID-21628 Field 6H, 6R
CFSTI Prices: HC$2.00 MF$0.50

Economic Research Service, Washington, D. C.
RADIATION-PASTEURIZING FRESH STRAWBERRIES AND OTHER FRESH FRUITS AND VEGETABLES: ESTIMATES OF COSTS AND BENEFITS.
Mar 65, 30p ERS-225
Contract AT(49-11)-2085

Unclassified report

Descriptors: (*Vegetables, Irradiated foods), (*Fruits, Irradiated foods), (*Irradiated foods, Costs).

TID-21711 Field 6R
CFSTI Prices: HC$1.00 MF$0.50

Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
STRONTIUM-90 LEVELS IN THE DIETS AND BONES OF CHILDREN.
Progress rept. for 1965,
1965, 21p
Contract AT(30-1)-2753

Unclassified report

Descriptors: (*Diet, Radioactive isotopes), (*Bone, Radioactive isotopes).

UCD-472-111 Field 6R
CFSTI Prices: HC$4.00 MF$1.00

California Univ., Davis. School of Veterinary Medicine.
LONG TERM EFFECTS OF X-RADIATION ON THE BEAGLE.
Annual progress rept. no. 14,
by A. C. Andersen. Apr 65, 143p
Contract AT(04-3)-472

Unclassified report

Descriptors: (*Radiation effects, Dogs).

UCRL-11833 Field 6E, 6C, 6A
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
BIOLOGY AND MEDICINE, FALL 1964.
Semiannual rept.,
Ed by John H. Lawrence. 1964, 163p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Medical research, Reports), (*Biology, Scientific research).

UCRL-11950 Field 6A, 6C
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
CHEMICAL EVOLUTION,
by Melvin Calvin. Aug 64, 20p CONF-640809-1
Contract W-7405-eng-48

Unclassified report

Presented at the International Botanical Congress, no. 10, Edinburgh.

Descriptors: (*Biochemistry, Genetics), (*Genetics, Biochemistry).

UCRL-14146 Field 6R, 6H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
I-131, I-133, AND COW MILK,
by Arthur R. Tamplin. 10 Apr 65, 17p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Milk, Radioactive isotopes), (*Iodine, Milk).

07. Chemistry

AGN-TP-110 Field 7E, 7B
CFSTI Prices: HC$2.00 MF$0.50

Aerojet-General Nucleonics, San Ramon, Calif.
INVESTIGATIONS OF DECONTAMINATING FISSIONCHEMICALLY-PRODUCED HYDRAZINE,
by Robert H. Black. 1963, 26p
CONF-654-36, AED-CONF-64-219-4
Contract AT(04-3)-368
Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, Calif., 30 Nov - 3 Dec 64.

Descriptors: (*Hydrazine, Decontamination).

ANL-6998 Field 7E, 7B
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
THE PURIFICATION OF 10 CURIES OF CM242,
by E. P. Horwitz, C. A. A. Bloomquist, H. W. Harvey, D. Cohen, and L. J. Basile. Feb 65, 14p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Curium, Purification).

ANL-6999 Field 7D, 7C, 7B
CFSTI Prices: HC$1.00 MF$0.75

Argonne National Lab., Ill.
NITRIC ACID-ORGANIC SOLVENT MIXTURES FOR SEPARATION OF PLUS-THREE ACTINIDES ON ANION RESINS. I. SURVEY OF SOLVENTS,
by D. C. Stewart, C. A. A. Bloomquist, and J. P. Faris. Feb 65, 21p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Actinide series, Separation), (*Ion exchange, Organic solvents), (*Organic solvents, Reviews).

ANL-7005 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
GRAVIMETRIC METHOD FOR THE DETERMINATION OF THORIUM AND PHOSPHORUS IN THORIUM PHOSPHIDES,
by R. E. Telford and Y. Baskin. Feb 65, 9p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Thorium, Gravimetric analysis), (*Phosphorus, Gravimetric analysis).

ANL-7020 Field 7A
CFSTI Prices: HC$6.00 MF$1.50

Argonne National Lab., Ill.
CHEMICAL ENGINEERING DIVISION RESEARCH HIGHLIGHTS.
Rept. for May 64-Apr 65.
1965, 276p
Contract W-31-1/9-eng-38
Unclassified report

Descriptors: (*Chemical engineering, Reviews).

BNL-7750 Field 7C, 7E, 6A
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CARBONYL-C 14-LABELED DL-KYNURENINE,
by L. V. Hankes. 1963, 8p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Amino acids, Labeled substances), (*Dibasic acids, Labelled substances).

BNL-7938 Field 7C
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CRYSTAL AND MOLECULAR STRUCTURE OF TRIS-TRIPHENYLPHOSPHINE RHODIUM CARBONYL HYDRIDE,
by Sam J. Laplaca and James A. Ibers. 1964, 27p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Rhodium compounds, Metalorganic compounds), (*Metalorganic compounds, Molecular structure).

BNL-8243 Field 7C, 7D
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE MECHANISM OF THE THERMAL DECOMPOSITION OF ALPHA-PHENYLETHYLAZOMETHANE, A TWO-STEP REACTION,
by Stanley Seltzer and F. T. Dunne.
1964, 28p CONF-322-16
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the American Chemical Society National Meeting (146th) Denver, Colo. Jan 64.

Descriptors: (*Organic nitrogen compounds, Pyrolysis).

BNL-8385 Field 7D, 7B
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A KINETIC STUDY OF THE DECOMPOSITION OF CESIUM - GRAPHITE LAMELLAR COMPOUNDS,
by F. J. Selzano and S. Aronson. 1964, 32p
CONF-571-36
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the American Chemical Society National Meeting, (148th) Chicago, Ill. Aug-Sep 64.

Descriptors: (*Cesium compounds, Decomposition), (*Graphite, Decomposition).

BNL-8537 Field 7E, 7C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N.Y.
REACTIONS AND MECHANISMS INVOLVING HOT CARBON ATOMS AND N2-H2, N2-ALKANE AND N2-ALKANE-MODERATOR SYSTEMS INCLUDING THEIR RELATIONSHIP TO OTHER SIMPLE SYSTEMS,
by Hans Ache and Alfred P. Wolf. 1964, 20p
CONF-773-3
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the Symposium on Chemical Effects Associated with Nuclear Reactions and Radioactive Transformation, Vienna, Dec 64.

Descriptors: (*Organic nitrogen compounds, Labeled substances).

BNL-8621 Field 7E, 7C
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
COMPETITIVE GAS PHASE REACTIONS OF C11 IN BINARY OXYGEN - ALKANE SYSTEMS,
by G. Stoecklin and A. P. Wolf. 1964, 20p
CONF-773-4; SM57/50
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the Symposium on chemical effects associated with nuclear reactions and radioactive transformation, Vienna, Dec 64.

Descriptors: (*Carbon, Chemical reactions), (*Radioactive isotopes, Carbon).

BNL-8801 Field 7E, 11I, 7C
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
CO60 GAMMA RADIATION INDUCED POLYMERIZATION OF ETHYLENE AT CONSTANT CONDITIONS IN A NON-FLOW SYSTEM,
by L. E. Kukacka, P. Colombo, J. Fontana, and M. Steinberg. Jan 65, 39p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Alkenes, Polymerization), (*Radiochemistry, Polymerization), (*Polyethylene plastics, Synthesis(Chemistry)).

BNL-8889 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
REPULSIVE ATOM-ATOM INTERACTIONS.
by Cavid Erginsoy. 1963, 30p
Contract AT(30-2)-GEN-16
Unclassified report

Presented at the Istanbul International Summer School of Quantum Chemistry 17 Aug - 5 Sep 64.

Descriptors: (*Atoms, Kinetic theory), (*Kinetic theory, Atoms).

COO-1148-90 Field 7D, 7C
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
ELECTROOXIDATION IN PYRIDINE AT THE PYROLYTIC GRAPHITE ELECTRODE.
by W. Richard Turner and Philip J. Elving.
8 Dec 64, 13p
Contract AT(11-1)-1148
Unclassified report

Descriptors: (*Pyridines, Oxidation), (*Electrochemistry, Pyridines).

COO-1148-93 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
EFFECT OF DIRECTION OF POLARIZATION ON CURRENT-POTENTIAL CURVES AT SOLID ELECTRODES.
by Laura Chuang and Philip J. Elving. 20 Jan 65, 25p
Contract AT(11-1)-1148
Unclassified report

Descriptors: (*Electrodes, Polarization), (*Electrochemistry, Electrodes).

COO-1148-94 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Michigan Univ., Ann Arbor.
INORGANIC POLAROGRAPHY IN ORGANIC SOLVENTS.
by Reiji Takahashi. 20 Jan 65, 32p
Contract AT(11-1)-1148
Unclassified report

Descriptors: (*Organic solvents, Polarographic analysis), (*Polarographic analysis, Organic solvents).

COO-1148-95 Field 7C, 6A, 7D
CFSTI Prices: HC$1.00 MF$0.50

Michigan Univ., Ann Arbor.
POLAROGRAPHIC REDUCTION OF ADENIN E 1-N-OXIDE.
by Charles R. Warner and Philip J. Elving.
27 Feb 65, 24p Unclassified report
Contract AT(11-1)-1148
Descriptors: (*Purines, Reduction(Chemistry)), (*Electrochemistry, Purines).

DP-714 Field 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
EFFECT OF BARBITURIC ACID AND HYDRAZINE ON SOLVENT EXTRACTION AND ION EXCHANGE BEHAVIOR OF NITROSYLRUTHENIUM,
by Richard M. Wallace. Jul 62, 20p
Contract AT(07-2)-1
Unclassified report

Descriptors: (*Ruthenium compounds, Purification).

DP-752 Field 7A
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
PERFORMANCE OF A 10-INCH CENTRIFUGAL CONTACTOR,
by A. Thomas Clark, Jr. Sep 62, 14p
Contract AT(07-2)-1 Unclassified report

Descriptors: (*Centrifuges, Performance(Engineering)), (*Solvent extraction, Centrifuges).

DP-849 Field 7A
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E.I.) and Co., Aiken, S. C. Savannah River Lab.
PURIFICATION OF RADIOACTIVE SOLVENT WITH A FLASH VAPORIZER,
by H. J. Clark and G. S. Nichols. Apr 65, 17p
CONF-611001-1 Unclassified report
Contract AT(07-2)-1
Presented at the Inter-American Congress of Chemical Engineers (1st), San Juan, Puerto Rico. 23-28 Oct 61.

Descriptors: (*Organic solvents, Purification), (*Radioactive wastes, Vaporization).

DP-952 Field 7C
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
STUDIES OF TRAMEX SOLVENT. I. EFFECTS OF MAJOR IMPURITIES IN TERTIARY AMINE EXTRACTANTS,
by Errol G. Orebaugh. Feb 65, 12p
Contract AT(07-2)-1
Unclassified report

Descriptors: (*Solvent extraction, Impurities), (*Amines, Impurities).

GAT-501 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Goodyear Atomic Corp., Piketon, Ohio.
THE MICRODETERMINATION OF SULFUR IN URANIUM COMPOUNDS,
by C. R. Walker and C. F. Trivisonno. 15 Mar 65, 10p
Contract AT(33-2)-1
Unclassified report

Descriptors: (*Sulfur, Chemical analysis), (*Uranium compounds, Impurities).

IDO-14655 Field 7E, 18J
CFSTI Prices: HC$6.00 MF$1.25

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
ANNUAL REPORT OF DIVISION ANALYTICAL BRANCH FOR 1964,
by Ralph C. Shank. Apr 65, 212p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor materials, Chemical analysis), (*Chemical analysis, Reviews).

IS-450 Field 7C, 7D
CFSTI Prices: HC$9.93 MF$3.00

Ames Lab., Iowa State Univ. of Science and Tech.
CALCULATIONS ON ELECTRONIC SPECTRA OF CATACONDENSED AND PERICONDENSED AROMATIC HYDROCARBONS,
by Richard L. Hummel and K. Kuedenberg.
Dec 64, 693p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Aromatic compounds, Spectroscopy).

IS-968 Field 7D, 7C
CFSTI Prices: HC$5.00 MF$1.25

Ames Lab., Iowa State Univ. of Science and Tech.
NATURE OF THE ENERGY LEVELS IN HYDRATED THULIUM ETHYLSULPHATE,
by Lewis C. Bartel and Frank H. Spedding.
Aug 64, 193p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Thulium compounds, Metalorganic compounds), (*Metalorganic compounds, Atomic energy levels).

IS-1061 Field 7B, 18J
CFSTI Prices: HC$4.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
REACTIONS OF URANIUM CARBIDE IN A FUSED KCL - LICL/SYSTEM,
by William C. Robinson, Jr., and Pramo Chiotti.
Nov 64, 112p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Uranium compounds, Chemical reactions), (*Carbides, Chemical reactions).

IS-1121 Field 7C, 7D
CFSTI Prices: HC$4.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
STABILITY CONSTANTS OF SOME LANTHANIDE-ALIPHATIC ALPHA-HYDROXYCARBOXYLATES,
by David Fleischer and Jack E. Powell. Feb 65, 117p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Complex compounds, Stability), (*Rare earth compounds, Complex compounds).

IS-1122 Field 7D, 7C
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
STABILITY CONSTANTS OF THE TRIVALENT LANTHANONS WITH SOME ALPHA-HYDROXY-CARBOXYLIC ACIDS,
by George S. Paul and Jack E. Powell. Feb 65, 85p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Rare earth compounds, Complex compounds), (*Complex compounds, Stability).

IS-1153 Field 7D
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
ANION EXCHANGE SEPARATIONS OF THE RARE EARTHS IN NONAQUEOUS SOLVENTS,
by Richard G. Greene and James S. Fritz. Feb 65, 87p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Ion exchange, Rare earths), (*Rare earths, Ion exchange).

IS-T-2 Field 7B
CFSTI Prices: HC$2.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
REVERSED-PHASE CHROMATOGRAPHIC SEPARATION OF ZIRCONIUM AND HAFNIUM,
Masters' thesis,
by Russell Thomas Frazea. Feb 65, 41p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Zirconium, Chromatographic analysis), (*Hafnium, Chromatographic analysis).

IS-T-3 Field 7C
CFSTI Prices: HC$3.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
PREPARATION AND SOME ANALYTICAL APPLICATIONS OF TRI-N-OCTYLPHOSPHINE SULFIDE,
Masters thesis,
by Donald Edward Elliott. Feb 65, 55p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Phosphines, Sulfides).

K-1627 Field 7D, 7B
CFSTI Prices: HC$6.00 MF$1.25

Oak Ridge Gaseous Diffusion Plant, Tenn.
KINETICS AND MECHANISM OF THE FLUORINATION OF COPPER (I) OXIDE AND COPPER (II) OXIDE,
by Robert Lucien Ritter. 29 Mar 65, 247p
N65-19809
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Copper compounds, Fluorination), (*Fluorination, Reaction kinetics).

K-1635 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge Gaseous Diffusion Plant, Tenn.
CALCULATION OF THE DENSITY AND VISCOSITY OF SUCROSE SOLUTIONS,
by E. J. Barber. 24 Jun 65, 43p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Sucrose, Solutions).

LA-3164 Field 7D, 20M
CFSTI Prices: HC$5.00 MF$1.00

Los Alamos Scientific Lab., Univ. of California, N. Mex.
HEATS OF DISSOCIATION OF GASEOUS HALIDES,
by R. C. Feber. Nov 64, 185p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Halides, Dissociation), (*Dissociation, Thermochemistry).

LA-3182-MS Field 7D, 11F
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
HIGH RESOLUTION SPECTROSCOPY. NEW APPARATUS AND TECHNIQUES FOR THE STUDY OF THE OPTICAL SPECTRUM OF URANIUM,
by David W. Steinhaus. 15 Sep 63, 61p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Uranium, Spectroscopy).

LA-3193 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
DETERMINATION OF BORIC ACID IN ADMIXTURE WITH CYANURIC ACID,
by Raymond N. Rogers. 30 Oct 64, 16p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Boric acids, Chemical analysis).

LA-3226 Field 7B
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE SPECTROPHOTOMETRIC DETERMINATION OF URANIUM IN MIXTURES OF URANIUM AND MOLYBDENUM,
by A. D. Hues and A. L. Henicksman. Jan 65, 22p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Molybdenum, Mixtures), (*Uranium, Spectroscopy).

LA-3247 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE SPECTROPHOTOMETRIC DETERMINATION OF SILICON IN PLUTONIUM,
by T. K. Marshall, K. S. Bergstresser, and G. R. Waterbury. 31 Jan 65, 14p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plutonium, Impurities), (*Silicon, Spectroscopy).

LA-3248 Field 7B, 11F, 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE SPECTROPHOTOMETRIC DETERMINATION OF TRACE AMOUNTS OF GALLIUM IN HIGH-PURITY PLUTONIUM METAL,
by Ross D. Gardner, Charles T. Apel, and William H. Ashley. Feb 65, 13p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plutonium, Impurities), (*Gallium, Spectroscopy).

LA-3268 Field 7D, 20J, 12A
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
A QUANTUM- AND CORRELATION-CORRECTED THOMAS-FERMI-DIRAC EQUATION WITH A FORTRAN CODE,
by John F. Barnes. 2 Apr 65, 46p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Integral equations, Quantum statistics), (*Quantum statistics, Atoms).

LA-DC-7108 Field 7B, 18H
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RADIATION DAMAGE TO THE SCINTILLATION PROPERTIES OF LITHIUM IODIDE CRYSTALS.
Master's thesis,
by Dale E. Hankins. 1964, 84p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Lithium compounds, Radiation damage), (*Iodides, Radiation damage).

MATT-235 Field 7A, 20C
CFSTI Prices: HC$2.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
MAGNETIC EFFECTS IN CERTAIN SYSTEMS OF CHEMICAL ENGINEERING INTEREST,
by F. W. Camp and E. F. Johnson. Sep 63, 46p
Contract AT(30-1)-1238
Unclassified report

Descriptors: (*Chemical engineering, Magnetic fields), (*Magnetic fields, Chemical engineering).

MATT-324 Field 7D, 18J
CFSTI Prices: HC$4.00 MF$1.00

Princeton Univ., N. J. Plasma Physics Lab.
KINETICS OF THE THERMAL DECOMPOSITION OF LITHIUM NITRATE,
by S. H. Cho and E. F. Johnson. Dec 64, 140p
N65-18219
Contract AT(30-1)-1238
Unclassified report

Descriptors: (*Reactor coolants, Pyrolysis), (*Lithium compounds, Nitrates).

MIT-1965-18 Field 7D, 7B
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge.
THERMODYNAMIC, SPECTRAL AND STRUCTURAL STUDIES OF COMPLEX IONS.
Annual rept. 16 Sep 64-14 Sep 65.
31 Mar 65, 17p
Contract AT(30-1)-1965
Unclassified report

Descriptors: (*Complex compounds, Ions).

N65-27347 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
OBSERVATIONS ON AFFINITY AND KINETIC BEHAVIOR OF SOME CHEMICAL REACTIONS,
by Marvin Garfinkle. Jul 65, 20p NASA-TN-D-2875
Unclassified report

Descriptors: (*Reaction kinetics, Reviews), (*Chemical reactions, Reviews).

NAA-SR-MEMO-10133 Field 7C, 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
THE DETERMINATION OF TRIPHENYLENE IN IRRADIATED ORGANIC REACTOR COOLANT AND HIGH BOILER SAMPLES BY GAS CHROMATOGRAPHY,
by R. C. Shepard. 18 Jun 64, 9p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Polycyclic compounds, Chromatographic analysis), (*Reactor coolants, Chromatographic analysis).

NYO-2383-12 Field 7E, 7C
CFSTI Prices: HC$1.00 MF$0.50

Boston Univ., Mass.
STUDIES OF THE RADIATION CHEMISTRY OF ORGANIC COMPOUNDS.
Progress rept.,
by Norman N. Lichtin. 5 Feb 65, 12p
Contract AT(30-1)-2383
Unclassified report

Descriptors: (*Organic compounds, Radiation chemistry), (*Radiation chemistry, Organic compounds).

NYO-3329-2 Field 7E, 6L
CFSTI Prices: HC$1.00 MF$0.50

Columbia Univ., New York. Dept. of Chemical Engineering.
RADIATION SYNTHESIS OF ARTIFICIAL KIDNEY MEMBRANES.
Annual rept. 1 Feb 64-31 Jan 65.
6 Apr 65, 18p
Contract AT(30-1)-3329
Unclassified report

Descriptors: (*Membranes(Biology), Radiation chemistry), (*Radiation chemistry, Membranes(Biology)), (*Mechanical organs, Kidneys).

ORNL-3527 Field 7A
CFSTI Prices: HC$6.00 MF$1.50

Oak Ridge National Lab., Tenn. Chemical Technology Div.
ENGINEERING DEVELOPMENT OF A FOAM COLUMN FOR COUNTERCURRENT SURFACE-LIQUID EXTRACTION OF SURFACE-ACTIVE SOLUTES.
Doctoral thesis,
by P. A. Haas. Jun 65, 245p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Surface-active substances, Solvent extraction), (*Solvent extraction, Industrial equipment).

ORNL-3785 Field 7D, 7B, 7C, 18J
CFSTI Prices: HC$5.00 MF$1.25

Oak Ridge National Lab., Tenn.
CHEMICAL TECHNOLOGY DIVISION, CHEMICAL DEVELOPMENT SECTION C, STATUS AND PROGRESS REPORT ON SEPARATIONS RESEARCH AND DEVELOPMENT,
by K. B. Brown. Apr 65, 186p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor materials, Purification), (*Separation, Reviews).

ORNL-3789 Field 7E, 18J
CFSTI Prices: HC$7.00 MF$1.75

Oak Ridge National Lab., Tenn.
REACTOR CHEMISTRY DIVISION.
Progress rept. for period ending 31 Jan 65.
Apr 65, 372p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Nuclear reactors, Chemistry), (*Radiochemistry, Reactor materials).

ORNL-P-815 Field 7C, 6A
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
REFINEMENT OF THE STRUCTURE OF ALPHA-D-GLUCOSE FROM NEUTRON DIFFRACTION DATA,
by George M. Brown and Henri A. Levy.
1965, 3p CONF-650202-1
Contract W-7405-eng-26
Unclassified report

Presented at American Crystallographic Assn., Suffern, N. Y.

Descriptors: (*Glucose, Molecular structure), (*Neutron diffraction analysis, Glucose).

ORNL-P-902 Field 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
ANHYDROUS ION-EXCHANGE STUDIES OF ALKALI METAL IONS IN ETHYLENEDIAMINE,
by D. A. Lee and J. L. Pauley. 5p
CONF-65-401-1
Contract W-7405-eng-26
Unclassified report

Presented at the meeting of American Chemical Society, Detroit, Mich. 4-9 Apr 65.

Descriptors: (*Alkali metals, Ion exchange), (*Ethylenediamine, Ion exchange).

ORNL-P-925 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE ABSORPTION SPECTRA OF H20 AND D20 IN THE NEAR INFRARED REGION AS A FUNCTION OF TEMPERATURE FROM -20 DEGREE TO 250 DEGREE C,
by W. C. Waggener, A. J. Weinberger, and R. W. Stoughton. 1964, 14p CONF-650401-2
Contract W-7405-eng-26
Unclassified report

Presented at the meeting of American Chemical Society, Detroit, Mich. 4-9 Apr 65.

Descriptors: (*Heavy water, Spectra(Infrared)), (*Infrared spectroscopy, Heavy water).

ORNL-TM-1009 Field 7D
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SEPARATION AND IDENTIFICATION OF VOLATILE IODINE COMPOUNDS BY FRACTIONAL SUBLIMATION AND MASS SPECTROMETRIC ANALYSIS,
by M. E. Davis and W. E. Browning, Jr. 30 Nov 64, 10p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Iodine compounds, Separation), (*Mass spectroscopy, Iodine compounds).

ORNL-TM-1012 Field 7D
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
AN ANNOTATED BIBLIOGRAPHY ON HIGH TEMPERATURE AND HIGH PRESSURE CHEMICAL RESEARCH,
by D. M. Helton and W. D. Bond. 14 Dec 64, 43p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Thermochemistry, Bibliographies), (*High-pressure research, Bibliographies).

ORNL-TM-1035 Field 7E
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE SEPARATION OF LONG-LIVED FISSION PRODUCT ELEMENTS BY USING ETHYLENEDIAMINETETRAACETATE IN AN ELECTRODIALYSIS CELL,
by A. Facchini and R. H. Rainey. 17 Feb 65, 28p
Contract W-7405-eng-26 Unclassified report

Descriptors: (*Fission products, Electrodialysis), (*Ethylenedinitrilo tetraacetates, Fission products), (*Electrodialysis, Fission products).

ORNL-TM-1061 Field 7B
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
SYNTHESIS AND INFRARED ABSORPTION SPECTRUM OF DIBORANE-10 B,
by H. L. Holsopple and Lucy E. Scroggie.
19 Feb 65, 8p Unclassified report
Contract W-7405-eng-26
Descriptors: (*Diboranes, Synthesis(Chemistry)), (*Spectra(Infrared), Diboranes).

PB-168 341 Field 7B
CFSTI Prices: HC$2.00 MF$0.50

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
COMPARATIVE STUDY OF THE OXIDATION OF VARIOUS QUALITIES OF URANIUM IN CARBON DIOXIDE AT HIGH TEMPERATURES. (Etude Comparative de l'Oxydation de Diverses Qualites d'Uranium dans l'Anhydride Carbonique aux Temperatures Elevees),
by Rene Desrues and Jean Paidassi. Aug 65, 33p
Rept. no. CEA-R-2805 Unclassified report
Text in French, attached summary in English.

Descriptors: (*Uranium, Oxidation), (*Carbon dioxide, Uranium), Gravimetric analysis, France.

Uranium samples of six different qualities were subjected, in the temperature range 400 - 1000C, to the action of carbon dioxide carefully purified to eliminate oxygen and water vapour; the resulting oxidation was followed micrographically and also (but only in the range 400 - 700C) gravimetrically using an Ugine-Eyraud microbalance.

SC-RR-65-77 Field 7D
CFSTI Prices: HC$3.00 MF$0.50

Sandia Lab., Albuquerque, N. Mex.
ON THE 2 SIGMA PLUS G AND 2 SIGMA PLUS U STATES OF THE HYDROGEN MOLECULE ION,
by James N. Peek. Apr 65, 44p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Hydrogen, Ions), (*Atomic energy levels, Hydrogen).

SC-TM-64-1739 Field 7D, 11I
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
POLYMER MOLECULAR WEIGHT DETERMINATION BY HIGH TEMPERATURE VAPOR PRESSURE OSMOMETRY,
by J. P. Burger. Nov 64, 22p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Polymers, Molecular weight).

TID-19078 Field 7C
CFSTI Prices: HC$1.00 MF$0.50

Kedzie Chemical Lab., Michigan State Univ., East Lansing.
COMPLEXES OF SOME 1-SUBSTITUTED TETRAZOLES AND CO(II), NI(II), PT(II), AND ZN(II) CHLORIDES,
by G. Gilbert and C. H. Brubaker, Jr. 15 Jul 63, 17p
Contract AT(11-1)-399

Unclassified report

Descriptors: (*N-heterocyclic compounds, Complex compounds), (*Complex compounds, N-heterocyclic compounds).

TID-21381 Field 7C, 7E
CFSTI Prices: HC$5.00 MF$1.00

Georgia Inst. of Tech., Atlanta.
TRACER STUDIES IN CLEAVAGE OF ALLYL-1-C 14-TRIMETHYLAMMONIUM CHLORIDE, ALLYL CHLORIDE-1-C 14, ALLYL ALCOHOL-1-C 14 AND P-TOLYL ALLYL-1-C 14 SULFIDE WITH METALS.
Doctoral thesis,
by Suresh Chandra. Mar 61, 155p
Contract AT(40-1)-2591

Unclassified report

Descriptors: (*Organic compounds, Decomposition).

TID-21385 Field 7E, 7B
CFSTI Prices: HC$6.00 MF$1.50

Vanderbilt Univ., Nashville, Tenn.
RADIATION STABILITY AND INORGANIC RADIOCHEMISTRY.
Terminal rept.,
by G. T. Fisher, and W. D. Threadgill. 30 Sep 64, 247p
Contract AT(40-1)-1327

Unclassified report

Descriptors: (*Inorganic compounds, Radiochemistry), (*Radiochemistry, Inorganic compounds).

TID-21511 Field 7D, 7B
CFSTI Prices: HC$4.00 MF$1.00

Pennsylvania State Univ., University Park. Dept. of Chemistry.
VOLTAMMETRY OF WATER AS A SOLUTE IN A MOLTEN ALKALI NITRATE SOLVENT.
Master's thesis,
by Thomas Edward Geckle. Jun 64, 126p
Contract AT(30-1)-2133

Unclassified report

Descriptors: (*Water, Electrochemistry), (*Nitrates, Electrochemistry).

TID-21520 Field 7E, 11I, 11J
CFSTI Prices: HC$1.00 MF$0.50

Georgia Univ., Athens Dept. of Physics.
INFRARED SPECTRA OF PLASTICS AND ELASTOMERS AFTER NUCLEAR IRRADIATION.
Progress rept.,
by W. C. Sears. 3 Sep 64, 21p
Contract AT(40-1)-2418

Unclassified report

Descriptors: (*Plastics, Radiation damage), (*Elastomers, Radiation damage), (*Infrared spectroscopy, Polymers).

TID-21523 Field 7E, 11I, 11J
CFSTI Prices: HC$2.00 MF$0.50

Georgia Univ., Athens. Dept. of Physics.
INFRARED SPECTRA OF PLASTICS AND ELASTOMERS AFTER NUCLEAR IRRADIATION.
Research rept. for 1964,
by W. C. Sears. 18 Dec 64, 29p
Contract AT(40-1)-2418

Unclassified report

Descriptors: (*Plastics, Radiation damage), (*Elastomers, Radiation damage), (*Infrared spectroscopy, Polymers).

TID-21684 Field 7D
CFSTI Prices: HC$4.00 MF$1.00

Minnesota Univ., Minneapolis.
STUDIES OF THE LUMINESCENE OF SOLUTIONS OF BENZENE AND SOME SIMPLE BENZENE DERIVATIVES.
Doctoral thesis,
by William Phillip Helman. Dec 64, 135p
Contract AT(11-1)-913

Unclassified report

Descriptors: (*Aromatic compounds, Luminescence), (*Luminescence, Aromatic compounds).

UCRL-11605 Field 7D, 14B
CFSTI Prices: HC$4.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
APPARATUS FOR MOLECULAR BEAM STUDIES OF CHEMICAL DYNAMICS,
by Kent Raymond Wilson. 15 Aug 64, 134p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Molecular beams, Instrumentation), (*Reaction kinetics, Molecular beams).

UCRL-11649 Field 7D, 7C
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Berkeley.
TEMPERATURE DEPENDENCE OF FLUORINE MAGNETIC RESONANCE SPECTRA.
Doctoral thesis,
by Richard Newmark. Nov 64, 194p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Fluorine, Nuclear magnetic resonance), (*Nuclear magnetic resonance, Halogenated hydrocarbons).

UCRL-11780 Field 7E, 7B
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Berekely.
REACTIONS OF HE 9 WITH LIGHT ELEMENTS APPLICATIONS TO ACTIVATION ANALYSIS.
Doctoral thesis,
by John D. Mahony. Jan 65, 66p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Helium, Chemical reactions), (*Radioactivation analysis, Helium).

UCRL-12168 Field 7C, 19A
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
SOME 1/1 COMPLEXES OF CYCLOMETHYLENETETRANITRAMINE (HMX) AND THEIR APPLICATION TO THE ESTIMATION OF HMX IN ADMIXTURE WITH RDX,
by Walter Selig. Nov 64, 25p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Complex compounds, Explosive materials), (*HMX, Chemical analysis).

08. Earth Sciences and Oceanography

BNL-7881 Field 8J, 20H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
EXPERIMENTS TO TEST THE PRESENCE OF COSMOGENIC NUCLIDES IN OCEAN SEDIMENTS,
by O. A. Schaeffer, G. Megrue and S. O. Thompson.
1964, 6p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Cosmic rays, Ocean bottom sampling), (*Ocean bottom sampling, Cosmic rays).

TEI-859 Field 8G
CFSTI Prices: HC$1.00 MF$0.50

Geological Survey, Washington, D. C.
GEOLOGIC MAP AND SECTIONS OF THE THIRSTY CANYON SE QUADRANGLE, NYE COUNTY, NEVADA,
by P. W. Lipman, W. D. Quinlivan, W. J. Carr, and R. E. Anderson. Feb 65, 16p

Unclassified report

Descriptors: (*Geology, Nevada), (*Maps, Nevada).

TEI-860 Field 8G
CFSTI Prices: HC$1.00 MF$0.50

Geological Survey, Washington, D. C.
GEOLOGIC MAP OF THE QUARTET DOME QUADRANGEL, NYE COUNTY, NEVADA,
by K. A. Sargent, S. J. Luft, A. B. Gibbons, and D. L. Hoover. Apr 65, 16p

Unclassified report

Descriptors: (*Geology, Nevada), (*Maps, Nevada).

TID-21350 Field 8H, 18H
CFSTI Prices: HC$1.00 MF$0.50

Weizmann Inst. of Science, Rehovoth (Israel).
TRITIUM CONCENTRATIONS IN NATURAL WATER SOURCES IN THE EASTERN MEDITERRANEAN AREA.
Final contract rept., 15 Jun 58-14 Jun 62,
by J. R. Gat and A. Hir. Nov 64, 22p
Contract AT(30-1)-2166

Unclassified report

Descriptors: (*Water supplies, Natural radioactivity), (*Tritium, Water supplies).

09. Electronics and Electrical Engineering

AD-422 194 Field 9C
CFSTI Price: HC$3.00

Minneapolis-Honeywell Regulator Co., Hopkins, Minn. Ordnance Div.
LOW INPUT VOLTAGE CONVERSION.
Quarterly progress rept. no. 3, 1 Jan-31 Mar 63,
by John T. Lingle and Sheldon D. Heaner.
31 Mar 63, 63p
Contract DA36 039SC90808, Proj. 1G6 22001A053 05

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Inverters, Power supplies), (*Rectifiers, Power supplies), Transistors, Oscillators, Feedback, Voltage regulators, Electric filters, Transistor amplifiers, Voltage.

During the third quarter, effort was concentrated on investigating the transitor approach to low input voltage conversion. This work was directed toward transistor convertor breadboard construction, checkout, and performance measurements. Converter power transformers were designed to step a 1.5 volt source up to 6.5 or 28 volt output levels. During this quarter, breadboard performance tests have verified the analytical work of the previous two quarters by proving that the transistor approach to low input voltage is promising. High over-all transistor converter efficiencies have been obtained with input voltages between 0.6 volt and 1.5 volts. Conversion efficiencies as high as 82.7% have been obtained with 1.5 volt inputs. Also high conversion efficiencies ranging between 73.5% and 80.5% have been obtained for input voltages between 0.7 and 1.0 volt respectively at lower output power. The design approach utilizes current feedback drive in the power amplifier stage. Performance data have proven that high efficiency can be obtained for large variations in both load current and input voltage. High efficiencies have been obtained over large input voltage and load variations, because optimum current feedback drive proportional to load current was used in the power amplifier stage. (Author)

BDX-613-63 Field 9C
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
RESISTANCE MEASUREMENTS BY RATIO EMPLOYING VOLTAGE TO FREQUENCY CONVERTERS.
Engineering memo. no. 30,
by K. H. Brackney. Aug 64, 8p
Contract AT(29-1)-613

Unclassified report

Descriptors: (*Resistance(Electrical), Measurement), (*Frequency converters, Resistance(Electrical)).

BNL-8663 Field 9E
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
COMPUTATIONAL RESULTS FOR THE HEM 11 MODE IN IRIS-LOADED DEFLECTORS,
by H. Hahn. 18 Nov 64, 11p AADD-54
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Waveguides, Optimization).

DP-953 Field 9A
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
SOLID-STATE DC AMPLIFIER WITH HIGH INPUT IMPEDANCE,
by Joseph S. Byrd. Feb 65, 14p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Current amplifiers, Transistors), (*Transistors, Current amplifiers).

EGG-1183-64 Field 9C, 9A
CFSTI Prices: HC$2.00 MF$0.50

Edgerton, Garmeshausen and Grier, Inc., Boston, Mass.
TRANSIENT RESPONSE OF THE TEM PRIMARY WAVE IN RADIAL TRANSMISSION LINE,
by Melvin M. Weiner. 21 Apr 64, 28p
Contract AT(29-1)-1183

Unclassified report

Descriptors: (*Transmission lines, Transients), (*Transients, Mathematical analysis).

GEAP-4702 Field 9B, 18I
CFSTI Prices: HC$5.00 MF$1.00

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SPECIFICATION OF SENN ON-LINE COMPUTER SYSTEM AND THERMAL-HYDRAULIC CALCULATIONAL FUNCTIONS,
by T. Sorlie. 15 Nov 64, 153p EURAEC-1313
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Programming(Computers), Reactor operation), (*Reactor operation, Programming-(Computers)).

IDO-17059 Field 9B
CFSTI Prices: HC$1.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
A TRANSISTORIZED BIDIRECTIONAL DECADE COUNTER,
by K. D. Smith. Jan 65, 18p
Contract AT(10-1)-205

Unclassified report

Descriptors: (*Computer logic, Digital systems), (*Transistors, Computer logic).

KAPL-M-6143 Field 9B, 20H
CFSTI Prices: HC$2.00 MF$0.75

Knolls Atomic Power Lab., Schenectady, N. Y.
KRUDE: RESONANCE ABSORPTION PROGRAM,
by K. R. Edgar. Oct 64, 47p KRE-2
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Resonance absorption, Programming-(Computer)), (*Nuclear physics laboratories, Resonance absorption).

N65-27344 Field 9B, 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
ANALOG TO DIGITAL CONVERTER FOR THE S-57 ION-CHAMBER EXPERIMENT,
by Joseph C. Thornwall. Jul 65, 16p
NASA-TN-D-2825

Unclassified report

Descriptors: (*Analog-to-digital converters, Satellites(Artificial)), (*Ionization chambers, Analog-to-digital converters).

NAA-SR-MEMO-8889 Field 9B, 12A
CFSTI Prices: HC$2.00 MF$0.75

Atomics International, Canoga Park, Calif.
NAA PROGRAM DESCRIPTION. ARES-II. A RESONANCE INTEGRAL CODE,
by F. L. Fillmore and B. D. O'Reilly. Jul 63, 43p
Supersedes AMTD-130-B
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Programming(Computers), Integrals), (*Integrals, Resonance).

OTR-125 Field 9A

National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
MICROMINIATURIZATION OF CIRCUIT COMPONENTS.
Jul 65, 18p Unclassified report

Prepared in cooperation with Westinghouse Electric Corp., Baltimore, Md.
Available free from CFSTI.

Descriptors: (*Circuits, Microminiaturization-(Electronics)), (*Microminiaturization(Electronics), Circuits), Integrated circuits, Packaged circuits, Semiconducting films, Resistors, Metal films,

Capacitors, Coils, Electric filters, Ceramic materials, Crystal oscillators, Quartz resonators, Modules(Electronic), Semiconductor devices, Films, Reviews, Abstracting, Bibliographies.

Significant reports covering the period since 1961 were selected for this study with reference to relevant earlier works. During this period further reduction in the size of discrete conventional components has been accomplished by the advancement of technology for controlling the geometric pattern and packaging of these components at the development stage. An additional advancement has been the fabrication of circuit components on a single substrate by controlled deposition of thin-films of the conducting, insulating, semiconducting, and ferromagnetic materials. Significant size reductions and a potential increase in reliability over conventional component techniques have been possible in each approach. Furthermore, it has been determined that production capability for fabrication of component and circuits is available. (Author)

PB-168 334 Field 9A
CFSTI Prices: HC$1.00 MF$0.50

SSCO Standards Lab., Inc., Southfield, Mich.
UHF OSCILLATOR, MODEL 1361-A (GENERAL RADIO).
Technical manual instrument calibration procedure, AG-82.
1 Jun 65, 9p
Contract N123 62861 35059A
NAVWEPS 17-20AG-82
Unclassified report

Descriptors: (*Oscillators, Calibration), Ultrahigh frequency, Electronic equipment, Instruction manuals, Test methods.

The manual describes the calibration procedure for the General Radio Model 1361-A UHF Oscillator, which covers the range of 450 to 1050 MC, Having a power output of 20 MW to 125 MW depending upon the Power Supply used. (Author)

UNM-TR-EE-120 Field 9E
CFSTI Prices: HC$2.00 MF$0.50

New Mexico Univ., Albuquerque. Engineering Experiment Station.
A MONOPOLE ANTENNA DRIVEN WITH RESPECT TO A SMALL DISC,
by R. H. Williams. Dec 64, 32p SC-DC-64-2098
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Antennas, Electrical impedance), (*Antenna radiation patterns, Antennas).

10. Energy Conversion (Non-propulsive)

AD-439 268 Field 10B, 20I, 9C
CFSTI Price: HC$4.00

Martin Marietta Corp., Baltimore, Md. Nuclear Div.
RESEARCH PROGRAM ON CLOSED-CYCLE MAGNETOPLASMADYNAMIC ELECTRICAL POWER GENERATION WITH NON-EQUILIBRIUM IONIZATION.
Final technical rept. for 15 Jun 62-31 Mar 64,
by W. B. Bienert. Apr 64, 126p
Rept. no. MND-3141
Contract Nonr386600 Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Magnetohydrodynamics, Energy conversion), (*Power supplies, Magnetohydrodynamics), (*Gas ionization, Theory), Generators, Design, Construction, Operation, Plasma medium, Helium group gases, Cesium, Electric conductance, Electric fields, Discharge tubes, Thermodynamics, Compressors, Heaters, Cooling.

A closed-cycle magnetoplasmadynamic loop, including compressor, heaters, generator, coolers, and auxiliary equipment and capable of operation with cesium-seeded helium, neon or argon, was designed, constructed, and tested. Also, a number of cesium-seeded helium-filled discharge tubes were fabricated and tested. The theory of a magnetically induced nonequilibrium ionization in an MPD generator was developed. This theory permits the prediction of electrical conductivity and the corresponding internal electric field required to attain that conductivity in an ionized seeded noble gas when it is in the nonequilibrium state. Equations governing the behavior of a conducting gas in the generator were solved for conditions compatible with the utilization of nonequilibrium ionization.

N65-16347 Field 10A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
LOW ENERGY PROTON EFFECTS IN SILICON AND GALLIUM ARSENIDE SOLAR CELLS,
by D. M. Brown. 1965, 20p NASA-TM-X-54990
Unclassified report

Descriptors: (*Solar cells, Radiation damage), (*Radiation damage, Solar cells), Protons, Silicon, Gallium alloys, Arsenic alloys.

PB-168 287 Field 10A, 1C, 16C
CFSTI Prices: HC$5.00 MF$1.00

AiResearch Mfg. Co., Los Angeles, Calif.
STUDY AND DEVELOPMENT OF SELECTION CRITERIA FOR OPTIMUM APPLICATION OF ACCESSORY POWER SYSTEMS TO WEAPON SYSTEMS.
Technical rept.,
by R. T. Caldwell, J. T. Ream, W. W. English, W. L. Burriss, and R. L. Krebs. Feb 58, 165p
Contract AF33 616 3694, Proj. 3085, Task 30499
WADC TR-58-462; AD 220 969
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Power supplies, Weapon systems), (*Aircraft equipment, Weapon systems), (*Guided missile components, Weapon systems), Auxiliary power plants, Electrical equipment, Hydraulic systems, Pneumatic systems, Turbines, Transmission lines, Weight, Performance(Engineering).

A secondary power system is defined to include the power generation equipment, conversion equipment and transmission equipment. Utilization equipment is not included and is considered to be a part of the vehicle design as dictated by the location and the required performance characteristics that are unique for the application. Data, factors and considerations are presented that can be used by manufacturers in the early design phases of an aircraft or missile to determine the type of system that appears most suitable, from a weight criterion, for the contemplated vehicle. Many factors enter into the selection of secondary power systems,

and it is impossible to set forth criteria that will enable a manufacturer to select a secondary power system that was evaluated on the basis of general requirements. The selection, therefore, must be based on criteria established from specific configurations and boundary conditions of the application and possibly on revised criteria that result from the design progress of the over-all configuration. The data presented are general quantitative weight data based on information obtained from manufacturers of the major components that make up electrical, hydraulic and pneumatic systems.

PB-168 330 Field 10A, 7D
CFSTI Prices: HC$5.00 MF$1.00

Pennsylvania Univ., Philadelphia. Electrochemistry Lab.
STUDIES IN FUNDAMENTAL CHEMISTRY OF FUEL CELL REACTIONS,
Quarterly progress rept. no. 3, 1 Oct 64-30 Jun 65,
by John O'M. Bockris. 30 Jun 65, 173p
Grant NsG325

Unclassified report

See also N64-33197.

Descriptors: (*Fuel cells, Electrochemistry), Electrodes, Catalysis, Chemical reactions, Voltage, Porous materials, Surface properties, Hydrogen, Transport properties, Adsorption, Electrical double layer.

Contents: Potentials of zero charge, Theoretical studies, Electrocatalysis, Catalytic activity for simple electrode reaction, Model porous electrode, Nature of the catalyst surface, Potential sweep method: a theoretical analysis, Proton transfer across double layers: mechanism evaluation from isotopic effects, A brief outline of electrocatalysis.

11. Materials

AD-413 977 Field 11D, 11E, 11I
CFSTI Price: HC$3.00

Smith (A. O.) Corp., Milwaukee, Wis.
GLASS SURFACE CHEMISTRY FOR GLASS FIBER REINFORCED PLASTICS.
Final summary rept. for 28 Jun 62-30 Jun 63,
by J. A. Laird. 30 Jun 63, 68p
Contract NOw62 0679C

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Surface properties, Glass textiles), (*Plastics, Composite materials), (*Glass textiles, Reinforcing materials), (*Glass, Surfaces), Laminates, Laminated plastics, Epoxy plastics, Bonding, Bubbles, Composite materials, Stresses, Mechanical properties, Shear stresses, Tensile properties, Adhesion, Degradation.

Special techniques were used to assess the effect of variations in E glass surfaces on glass-epoxy bond permanency, bond strength, and wetting. The interdependence of these properties was also studied. The report discusses problems associated with the glass interface in a glass fiber reinforced plastic structure and suggests further experiments needed to help solve these problems. (Author)

AD-463 490 Field 11I, 11G, 11F
CFSTI Price: HC$3.00

Army Chemical Research and Development Labs., Edgewood Arsenal, Md.
MATERIALS REVIEW (17th).
Rept. for Jul 64-Jan 65,
by Arthur Lyem. Apr 65, 93p
Special publication CRDL-SP-5-7
Proj. 1C522301A075

Unclassified report

Descriptors: (*Materials, Reviews), (*Polymers, Reviews), (*Alloys, Reviews), (*Plastics, Reviews), Abstracting, Metals, Metal coatings, Corrosion, Material forming, Bibliographies, Processing, Manufacturing methods, Toxicity, Polymerization, Inorganic compounds, Fibers(Synthetic), Organic compounds, Radiation damage, Medical research, Textiles.

This report presents important new technical and scientific information about materials research here and abroad, principally in the polymer and plastics fields. Information about recent technological advances is presented under five major headings: (1) high polymers, (2) plastic materials, (3) synthetic fibers, (4) miscellaneous organic and inorganic compounds, and (5) metals and alloys. Over 300 articles were abstracted from various publications and languages. Materials and technological aspects are discussed, and each abstract is numerically keyed to its reference in the bibliography. (Author)

ANL-7006 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
CORROSION OF EXPERIMENTAL THORIUM-BASE ALLOYS,
by James Y. N. Weng. Feb 65, 12p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Thorium alloys, Corrosion), (*Corrosion, Thorium alloys), Carbon alloys, Uranium alloys.

BNL-920 Field 11F, 18N
CFSTI Prices: HC$3.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
HIGH-TEMPERATURE LIQUID-METAL TECHNOLOGY REVIEW.
Bimonthly technical progress review, v3 n1.
Feb 65, 56p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Liquid metals, High-temperature research), Reports, Abstracting, Liquid metal coolants, Indexes.

BNWL-29 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
STATIC TESTS OF CORROSION INHIBITORS FOR ALUMINUM AND CARBON STEEL.
by R. B. Richman. Feb 65, 30p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Aluminum, Corrosion inhibition), (*Steel, Corrosion inhibition).

BNWL-30 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PRECIPITATE PARTICLES IN DILUTELY ALLOYED URANIUM QUANTITATIVE METALLOGRAPHY,
by K. N. Woods, Y. E. Smith and R. D. Leggett. Jan 65, 40p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Uranium alloys, Microstructure), Iron alloys, Silicon alloys, Particle size.

BNWL-48 Field 11F, 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
REACTION OF HYDROGEN WITH NIOBIUM AND TANTALUM IN THE ATR GAS LOOP,
by L. A. Charlot. Apr 65, 18p Unclassified report
Contract AT(45-1)-1830
Descriptors: (*Niobium, Hydrogen embrittlement), (*Tantalum hydrogen embrittlement), (*Hydrogen embrittlement, Reactor materials).

BNWL-96 Field 11B, 18J
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
BORONATED-GRAPHITE IRRADIATION STUDIES. FINAL REPORT OF IRRADIATION EXPERIMENTS CONDUCTED IN A HANFORD REACTOR,
by J. M. Davidson and L. O. Gates. Jun 65, 43p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Graphite, Radiation damage), (*Boron, Reactor materials), Carbides, Boron compounds.

CONF-729-3 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FINE GRAIN SIZE IN BERYLLIUM BY SPLATCOOLING,
by A. R. Kaufmann and W. C. Muller. Oct 64, 17p
Contract W-7405-eng-48
Unclassified report

Presented at the International Conference on Beryllium, Philadelphia, Pa. Oct 64.

Descriptors: (*Beryllium, Phase studies), (*Grain structures(Metallurgy), Beryllium).

CONF-640702-2 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Pennsylvania State Univ., University Park.
THE STRUCTURES OF YTTRIUM - ZINC INTERMETALLIC COMPOUNDS,
by K. S. Sree Harsha and Earle Ryba. 1964, 9p
AED-CONF-64-137-12 Unclassified report
Contract AT(30-1)-2133
Presented at the American Crystallographic Assocn. Annual Meeting, Bozeman, Mont.

Descriptors: (*Zinc alloys, Yttrium alloys), (*Yttrium alloys, Zinc alloys), Intermetallic compounds, Molecular structure, Crystallography.

COO-926-33 Field 11F, 20D
CFSTI Prices: HC$1.00 MF$0.50

Minnesota Univ., Minneapolis. Dept. of Chemical Engineering.
CRITICAL FLOW OF LIQUID METALS.
by H. S. Isbin. 15 Jan 65, 16p
Contract AT(11-1)-926
Unclassified report

Descriptors: (*Liquid metals, Fluid flow).

DP-328 Field 11F
CFSTI Prices: HC$2.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
GRAIN REFINEMENT OF URANIUM BY A BETA-QUENCH, ALPHA-ANNEAL PROCESS,
by Carl L. Angerman, Richard T. Huntoon, William R. McDonell, and R. C. Crapo. Feb 59, 26p
Contract AT(07-2)-1
Unclassified report

Descriptors: (*Uranium, Refining(Metallurgy)), (*Refining(Metallurgy), Heat treatment).

DP-957 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and DC., Aiken, S. C. Savannah River Lab.
STRESS CORROSION CRACKING OF AUSTENITIC STAINLESS STEEL.
Status rept. for 1 Sept 64,
by McIntyre E. Louthan, Jr. Feb 65, 20p
Contract AT(07-2)-1
Unclassified report

Descriptors: (*Stainless steel, Corrosion), (*Corrosion, Stresses), Fracture(Mechanics).

EURAEC-1322 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Virginia Polytechnic Inst., Blacksburg. Dept. of Metals and Ceramic Engineering.
THE RELATIONSHIP OF NITROGEN CONTENT OF AUSTENITIC STAINLESS STEELS TO STRESS CORROSION.
Quarterly rept. no. 2,
by B. N. Ferry. Dec 64, 10p
Contract AT(40-1)-3208
Unclassified report

Descriptors: (*Stainless steel, Corrosion), (*Nitrogen, Stainless steel), nitration, Stresses.

IS-T-1 Field 11F, 7B, 18J
CFSTI Prices: HC$4.00 MF$1.00

Ames Lab., Iowa State Univ. of Science and Tech.
CONCENTRATION OF CESIUM FROM POLLUCITE.
Masters' thesis,
by Tommy Lee Young. Feb 65, 123p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Cesium, Refining(Metallurgy)).

IS-T-9 Field 11F, 7D
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
THE RESISTIVITY OF MOLTEN BI - SN ALLOYS.
Masters thesis,
by Fred Yet Lieu. Feb 65, 72p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Liquid metals, Resistance(Electrical)), (*Bismuth alloys, Tin alloys).

LA-3097 Field 11F, 7B, 18J
CFSTI Prices: HC$0.50 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE GRAVIMETRIC DETERMINATION OF RHODIUM IN URANIUM - RHODIUM ALLOYS,
by Ross D. Gardner and William H. Ashley. May 64, 10p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Rhodium alloys, Gravimetric analysis), (*Uranium alloys, Gravimetric analysis).

LA-3118 Field 11F, 18J
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
FUSED SALT ELECTROREFINING OF MOLTEN PLUTONIUM AND ITS ALLOYS,
by L. J. Mullins and J. A. Leary. 20 Jul 64, 31p
CONF-571-33
Contract W-7405-eng-36
Unclassified report

Presented at the American Chemical Society National Meeting (148th) Chicago, Ill. Aug-2 Sep 64.

Descriptors: (*Plutonium, Refining(Metallurgy)).

LA-3213 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SPECTROPHOTOMETRIC DETERMINATION OF RHENIUM IN TANTALUM - RHENIUM ALLOYS,
by K. S. Bergatresser. Dec 64, 13p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Rhenium alloys, Spectroscopy), (*Tantalum alloys, Spectroscopy).

LA-3225 Field 11F, 7B
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE GRAVIMETRIC DETERMINATION OF HYDROGEN IN MOLYBDENUM METAL,
by Ross D. Gardner, William H. Ashley, and Paul Bergstresser. Jan 65, 10p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Molybdenum, Impurities), (*Hydrogen, Gravimetric analysis).

LA-3252 Field 11F, 7D, 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE SOLUBILITIES OF SELECTED ELEMENTS IN LIQUID PLUTONIUM. III. TUNGSTEN,
by D. F. Bowersox and J. A. Leary. 1 Dec 64, 12p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Tungsten, Solubility), (*Plutonium, Solutions).

LA-3258 Field 11F, 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE X-RAY ABSORPTION EDGE DETERMINATION OF PLUTONIUM IN URANIUM - PLUTONIUM - MANGANESE ALLOYS,
by R. G. Hurley, E. A. Hakkila, and G. R. Waterbury. 28 Dec 64, 12p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plutonium alloys, X-ray absorption analysis), (*Uranium alloys, X-ray absorption analysis), (*Manganese alloys, X-ray absorption analysis).

LA-3285-MS Field 11B, 11F
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
IRRADIATION DAMAGE TO CERAMICS, METALLIC-CERAMIC BONDS, AND BRAZING ALLOYS,
by Alton J. Patrick. Jan 65, 45p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Ceramic materials, Radiation damage), (*Alloys, Radiation damage).

LADC-6199 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE PLUTONIUM - SILICON SYSTEM,
by C. C. Land, K. A. Johnson, and F. H. Ellinger. 1963, 24p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plutonium alloys, Silicon alloys), (*Phase studies, Plutonium alloys), Crystal structure, Eutectics.

MLM-734 Field 11F, 7B
CFSTI Prices: HC$2.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
BISMUTH RECOVERY PROCESS.
Engineering research final rept.,
by W. J. Raiff, P. M. Engle, and M. McEwen.
5 Aug 52, 45p
Contract AT(33-1)-GEN-53
Unclassified report

Descriptors: (*Bismuth, Refining(Metallurgy)).

NAA-SR-MEMO-9622 Field 11B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
PULSE HEATING,
by M. W. Halseth. 11 Feb 64, 19p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Zirconium compounds, Hydrides), (*Hydrides, Zirconium compounds), Hydrogen, High temperature research.

NLCO-922 Field 11F, 18J
CFSTI Prices: HC$2.00 MF$0.50

National Lead Co. of Ohio, Cincinnati.
A SEMICONTINUOUS PROCESS FOR THE REDUCTION OF URANIUM TETRAFLUORIDE WITH MAGNESIUM,
by C. A. Neu, Jr., G. Brodi, D. L. Elston, J. H. Trapp, and O. R. Magoteaux. 22 Apr 65, 37p
Contract AT(30-1)-1156 Unclassified report

Descriptors: (*Uranium, Refining(Metallurgy)), (*Fluorides, Uranium compounds), Magnesium.

NMI-1265 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY. FUNDAMENTALS OF SINGLE-CRYSTAL DEFORMATION IN ZONE-REFINED BERYLLIUM.
Final rept., 1 Jul 63-30 Jun 64,
by D. F. Kaufman and L. R. Aronin. 1 Mar 65, 29p
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NMI-2132 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Progress rept. for Sep 64.
30 Nov 64, 33p
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NMI-2133 Field 11F, 13H
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Progress rept. for Oct 64.
11 Dec 64, 22p Unclassified report
Contract AT(30-1)-2784

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NMI-2134 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Progress rept. for Nov 64.
25 Jan 65, 27p NYO-2784-5 Unclassified report
Contract AT(30-1)-2784

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NMI-2135 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Monthly progress rept. Dec 64.
15 Feb 65, 27p NYO-2784-6
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattic defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NMI-2136 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Progress rept Jan 65.
8 Mar 65, 39p NYO-2784-7
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Rhenium alloys, Tungsten alloys, Extrusion, Drawing(Machine processing).

NYO-2784-8 Field 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Nuclear Metals, Inc., West Concord, Mass.
FUNDAMENTAL AND APPLIED RESEARCH AND DEVELOPMENT IN METALLURGY.
Progress rept. Feb 65.
8 Apr 65, 33p NMI-2137
Contract AT(30-1)-2784

Unclassified report

Descriptors: (*Beryllium, Single crystals), (*Tungsten, Pipes), Deformation, Crystal lattice defects, Extrusion, Drawing(Machine processing).

NYO-10722 Field 11F
CFSTI Prices: HC$5.00 MF$1.00

Pennsylvania Univ., Philadelphia.
STRAIN-ENHANCED SELF-DIFFUSION IN SILVER,
Doctoral thesis,
by Gordon Lloyd Fisher. 1965, 157p
Contract AT(30-1)-1879

Unclassified report

Descriptors: (*Silver, Diffusion), (*Diffusion, Silver), Strain(Mechanics).

ORNL-3787 Field 11F, 18J
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
EVALUATION OF HASTELLOY F AND OTHER CORROSION-RESISTANT STRUCTURAL MATERIALS FOR A CONTINUOUS CENTRIFUGE IN A MULTIPURPOSE FUEL-RECOVERY PLANT,
by W. E. Clark, L. Rice, and D. N. Hess. Apr 65, 14p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor fuel processing, Materials), (*Corrosion-resistant alloys, Effectiveness).

OTR-123 Field 11H

National Bureau of Standards, Washington, D. C.
Inst. for Applied Technology.
SOLID FILM LUBRICATION. Unclassified report
Aug 65, 16p
Available free from CFSTI.

Descriptors: (*Lubricants, Reviews), Lubrication, Films, Powders, Binders, Solids, Plastics, Ceramic materials, Nuclear physics, Spacecraft, Machining, Bearings, Bibliographies.

Significant reports covering the period since 1963 are included in the study, with reference to relevant earlier works. Recent Government R and D has generally proceeded along the lines of developing or testing new bulk solid or solid-film lubricant materials for special applications at extreme temperatures and high vacuum, for exposure to radiation, or for minimizing servicing. Considerable attention has also been paid to developing new lubrication systems and testing equipment.

OTR-127 Field 11D, 13H

National Bureau of Standards, Washington, D. C.
Inst. for Applied Technology.
FIBER-REINFORCED METALS AND ALLOYS.
Sep 65, 18p Unclassified report
Prepared in cooperation with Williams (Clyde) and Co., Columbus, Ohio.
Available free from CFSTI.

Descriptors: (*Composite materials, Fiber metallurgy), (*Fiber metallurgy, Composite materials), (*Fibers, Reinforcing materials), Metals, Alloys, Aluminum compounds, Oxides, Boron, Ceramic fibers, Filaments, Refractory metals, Stresses, Crystal growth, Glass textiles, Ceramic materials.

Significant reports covering the period since 1963 were selected for this study, with references to relevant earlier works. Recent Government-sponsored R and D in the technology of fiber-reinforced metals and alloys has generally proceeded along two lines: the development of whiskers of high strength metals or ceramics for use as reinforcing agents; and the development of metal matrices reinforced by metals, ceramics, or glass. Promising candidate materials for fibers are graphite, boron, alumina (sapphire), silicon carbide, boron carbide, beryllium, and beryllia. Titanium, beryllium, chromium, zirconium, iron, nickel, and cobalt are considered promising matrix materials. Whiskers are grown chiefly by the vapor deposition technique, involving controlled supersaturation of a vapor over the surface of a substrate. The couple-stress theory has been developed to qualify micro-bodies and microlayers mathematically. Fiber-matrix composites developed and tested include steel-silver, tungsten-silver, and alumina-nickel. (Author)

OTR-128 Field 11C, 11I, 11D

National Bureau of Standards, Washington, D. C.
Inst. for Applied Technology.
PLASTIC COATINGS.
Sep 65, 16p
Unclassified report

Prepared in cooperation with Syracuse Univ. Research Corp., N. Y.
Available free from CFSTI.

Descriptors: (*Plastic coatings, Reviews), Storage, Laminates, Plastic seals, Protective treatments, Lubricants, Films, Packaging, Weatherproofing, Wear resistance, Dielectric films, Abstracting, Bibliographies, Plastics.

Significant reports covering the period since 1962 were selected for this study, with reference to earlier works. Compounds tested under the deteriorating effects of long-term storage at high humidity and temperatures have proved, for example, that laminates can be developed to withstand conditions previously found destructive to single transparent film barriers. Research also has shown that plastic coatings can be used in space environments and in underwater applications with predictable success. They can be a practical means of correcting past failures of coatings, especially those used for steel fuel storage tanks. Use of the fluidizedbed technique for coatings, both plastic and metallic, has revealed great future applications for sealing out liquid penetration in electrical, electronic, and mechanical equipment, as well as other beneficial uses. Plastic coatings also show promise where special heat-resistant, rain-erosion-resistant transparent barriers are needed. (Author)

Patent 3,200,075 Field 11H

LACTONE AMIDES IN LUBRICATING OILS.
Patent assigned to California Research Corp.,
by Donald J. Anderson. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, Amides), (*Lactones, Lubricant additives), (*Amides, Lubricant additives), Cleaning compounds, Acetates, Ethylenediamine, Polymers, N-heterocyclic compounds, Patents.

Amides of alkylbutyrolactone-alpha-acetic acid are used as a metal-free detergent in motor fuels. A lubricating oil containing from 0.1 to 30 percent by weight of an amide of an alkylbutyrolactone-alpha-acetic acid is useful as a detergent in fuel compositions such as burner fuel compositions, and motor fuel compositions, for example, in gasolines and in diesel fuels. The amine is tetraethylene pentamine or N-aminoethyl piperazine.

Patent 3,200,076 Field 11H

POLYPIPERAZINYL SUCCINIMIDES IN LUBRICATING OILS.
Patent assigned to California Research Corp.,
by Robert G. Anderson and Lewis R. Honnen. 10 Aug 65
Unclassified patent

Available from Commissioner of Patents, Washington, D.C., 20231, $0.50

Descriptors: (*Lubricant additives, N-heterocyclic compounds), (*N-heterocyclic compounds, Lubricant additives), Cleaning compounds, Polymers, Organic oxygen compounds, Halogen compounds, Patents.

Polypiperazinyl succinimides are used in lubricating oils as metal-free detergents to reduce the formation of sludges and varnishes in internal combustion engines. Polypiperazinyl succinimides are formed by reacting alkanyl succinic acid compounds with polypiperazinyl alkylenes. This detergent is used in oils of lubricating viscosity in amounts of from 0.1 to 10 percent by weight.

PB-168 343 Field 11C, 11F, 13H
CFSTI Prices: HC$3.00 MF$0.75

Commissariat a l'Energie Atomique, Saclay (France). Centre d'Etudes Nucleaires.
STUDY OF THE LOW TEMPERATURE OXIDATION OF URANIUM POWDERS AND ITS APPLICATION TO THE SINTERING OF URANIUM OXIDE POWDERS (Etude de l'Oxydation des Poudres d'Uranium a Basse Temperature et son Application au Frittage de Poudres d'Uranium oxyde),
Thesis,
by Madeleine Conte-Albert. 30 Jun 64, 89p
Rept. no. CEA-R-2828 Unclassified report
Text in French, attached summary in English.

Descriptors: (*Uranium, Oxidation), (*Uranium compounds, Sintering), Oxides, Powders, France, Ceramic materials, Powder metallurgy, Powder metals.

The uranium oxygen reaction has been studied with a view to obtaining U-U02 samples containing about 20 per cent by weight of U02 starting from spherical grain uranium powder. The techniques used are micrography, thermogravimetry, sintering under pressure, radiocrystallography. At 170C in air or argon + oxygen mixtures, the uranium oxide formed is always U02 and it is uniformly distributed around the initial uranium spheres. These mixed powders can easily be sintered under pressure in the gamma-phase. The density of the samples obtained is 85 to 90 per cent of the theoretical density. The influence of U02 on the properties of uranium has been shown by the use of dilatometry and thermal cycling in the alpha phase. The temperatures at which the phase changes between alpha and beta and between beta and gamma occur are lowered, the remenant expansion is decreased. (Author)

SB-413, Suppl. 1 Field 11F, 13H, 5B

Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.
BERYLLIUM.
Price list, selective bibliography of government research repts. and translations, Jul 60-Jun 65.
Jun 65, 36p
Available free from CFSTI. Unclassified report

Descriptors: (*Beryllium, Bibliographies), (*Bibliographies, Beryllium), (*Beryllium alloys, Bibliographies), Reports, Beryllium alloys, Beryllium compounds, Carbides, Isotopes, Toxicity, Safety, Patents.

Lists 564 domestic and foreign references on beryllium added to the CFSTI collection during the period July 1960 through June 1965. Reports are listed in the following categories: Beryllium Metals and Alloys; Beryllium compounds, carbides, and isotopes; toxicity and Safe handling of beryllium; and patents on beryllium available for license.

UCRL-14132 Field 11F
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
A STRESS-CRACKING STUDY OF A GAMMA EXTRUDED U - 8 W/O MO - 0.50 W/O TI ALLOY,
by C. A. W. Peterson. 15 Apr 65, 13p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Uranium alloys, Brittleness), Fracture-(Mechanics), Molybdenum alloys, Titanium alloys, Stresses.

USBM-RC-1158 Field 11F, 11B, 13H, 18J
CFSTI Prices: HC$2.00 MF$0.50

Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.
QUARTERLY METALLURGICAL PROGRESS REPORT NO. 26, JANUARY 1 - MARCH 31, 1965.
1965, 20p
Contract AT(11-1)-599
Unclassified report

Descriptors: (*Heat-resistant metals + alloys, Powder metallurgy), (*Powder metallurgy, Reactor materials), (*Reactor materials, Uranium compounds), Ceramic materials.

12. Mathematical Sciences

ANL-6984 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
AN ITERATIVE UNFOLDING METHOD FOR RESPONSE MATRICES,
by Raymond Gold. Dec 64, 40p Unclassified report
Contract W-31-109-eng-38
Descriptors: (*Matrix algebra, Iterative methods), (*Iterative methods, Matrix algebra).

BNL-7963 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
ON THE EXPLICIT CONSTRUCTION OF GENERALIZED EIGENFUNCTION EXPANSIONS,
by Joel David Pincus. 1963, 23p Unclassified report
Contract AT(30-2)-GEN-16
Descriptors: (*Series, Functions), (*Functions, Series).

COO-427-44 Field 12A
CFSTI Prices: HC$3.00 MF$0.75

Notre Dame Univ., Ind.
THE REPRESENTATION THEORY OF LIE GROUPS,
by Joseph Kahane. 1963, 65p Unclassified report
Contract AT(11-1)-427
Descriptors: (*Groups(Mathematics), Theory).

LA-3137 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SMOOTHING AND MULTIVARIABLE INTERPOLATION WITH SPLINES,
by T. L. Jordan. 1 Jun 64, 19p Unclassified report
Contract W-7405-eng-36
Descriptors: (*Least squares method, Polynomials), (*Statistical analysis, Polynomials).

LADC-6188 Field 12A, 20J
CFSTI Prices: HC$1.00 MF$0.50

Minnesota Univ., Minneapolis. School of Physics.
GALILEAN INVARIANCE AND GREENS FUNCTIONS FOR BOUND SYSTEMS,
by M. Bolsterli. 1963, 12p Unclassified report
Contract W-7405-eng-36
Descriptors: (*Invariance, Field theory), (*Green's function, Field theory).

LADC-6207 Field 12A
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE EIGENVALUE PROBLEM FOR SUBLINEAR OPERATORS WITH UNIFORMLY SYMMETRIZABLE DERIVATIVES,
by George H. Pimbley, Jr. 1963, 33p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Operators(Mathematics), Functional analysis).

LADC-6300 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
IRREDUCIBLE REPRESENTATIONS,
by George A. Baker, Jr. and N. Eugene Gilbert. 1963, 11p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Groups(Mathematics), Permutations), (*Permutations, Electron transitions).

LA-DC-6351 Field 12A
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
A VECTORIAL SUBDIVISION FOR SPACIAL INTEGRATION OF FUNCTIONS WITH CUBIC SYMMETRY,
by W. C. Overton, Jr. and A. F. Schuch. 1963, 22p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Integration, Functions), (*Vector analysis, Integration).

TID-21390 Field 12A
CFSTI Prices: HC$6.00 MF$1.50

Purdue Univ., Lafayette, Ind.
LECTURES ON THEORY OF APPROXIMATION,
by Michael Golomb. 1962, 292p Unclassified report
Contract W-31-109-eng-38
Descriptors: (*Numerical methods and procedures, Functions).

UCRL-12489 Field 12B, 9B
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
PROGRAM OPTIMIZING TECHNIQUES FOR THE CDC 6600 CENTRAL PROCESSOR,
by Harry L. Nelson. 6 Apr 65, 57p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Optimization, Programming(Computers)), (*Programming(Computers), Optimization).

WAPD-T-1479 Field 12A
CFSTI Prices: HC$3.00 MF$0.75

Pittsburgh Univ., Pa.
STABILITY OF A MULTIPLICATIVE STOCHASTIC PROCESS WITH LINEAR FEEDBACK.
Doctoral thesis,
by Donald John Dudziak. Mar 63, 100p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Stochastic processes, Stability), (*Feedback, Stochastic processes).

13. Mechanical, Industrial, Civil, and Marine Engineering

BMI-X-10096 Field 13H, 13K
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
SUMMARY REPORT ON THE FABRICATION OF PROJECTIONS ON ZIRCALOY TUBES,
by D. C. Drennon and R. E. Monroe. 4 Aug 64, 46p
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Zirconium alloys, Pipes), (*Pipes, Manufacturing method), Cladding, Processing.

BRB-77 Field 13H, 13I
CFSTI Prices: HC$2.00 MF$0.50

Bridgeport Brass Co., Seymour, Conn.
QUARTERLY PROGRESS SUMMARY, JANUARY - MARCH 1963.
6 Nov 63, 40p
Contract AT(30-1)-1405
Unclassified report

Descriptors: (*Extrusion, Uranium), (*Uranium, Extrusion), Dies, Mandrels, Material forming.

BRB-80 Field 13H, 13I
CFSTI Prices: HC$3.00 MF$0.75

Bridgeport Brass Co., Seymour, Conn.
QUARTERLY PROGRESS SUMMARY, OCTOBER TO DECEMBER 1963,
27 Mar 64, 58p
Contract AT(30-1)-1405
Unclassified report

Descriptors: (*Extrusion, Uranium), (*Uranium, Extrusion), Dies, Mandrels, Material forming.

LA-3232-MS Field 13H, 11B, 18J
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE FORMING AND EVALUATION OF UO2 AGGLOMERATES FOR CERMET APPLICATIONS,
by William H. Lenz and Marvin C. Tinkle. 15 Nov 64, 43p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Uranium compounds, Material forming), (*Refractory metal alloys, Cermets), Oxides, Powder metallurgy.

LA-3255-MS Field 13H, 11I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
FABRICATION OF TEFLON BY HYDROSTATIC PRESSING,
by J. S. Church, J. K. Donahoe, and H. Sheinberg.
10 Aug 64, 19p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Halocarbon plastics, Material forming), (*Material forming, Halocarbon plastics), Hydrostatic pressure, Hydroforming(Mechanical).

LAMS-2983 (Supp) Field 13D, 20K
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SUPPLEMENTAL IMPACT TESTS ON ICC 6-J AND ICC 2-R CONTAINER (B.E. 1736),
by Horace E. Noyes. 9 Apr 65, 18p Unclassified report
Contract W-7405-eng-36

Descriptors: (*Containers, Explosive materials), (*Impact shock, Containers).

N65-23252 Field 13M, 1B
CFSTI Prices: HC$3.00 MF$0.50

Clark, Buhr and Nexsen, Norfolk, Va.
STUDIES OF SONIC BOOM INDUCED DAMAGE.
May 65, 46p
Contract NAS1 1166 Unclassified report
NASA CR-227

Descriptors: (*Sonic boom, Damage).

NAA-SR-9827 Field 13A
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
FATIGUE CHARACTERISTICS OF 37-TUBE, MODULAR, STEAM GENERATOR HEAD,
by M. M. Lemcoe. 20 Apr 65, 19p Unclassified report
Contract AT(11-1)-GEN-8

Descriptors: (*Gas generating systems, Fatigue-(Mechanics)), Steam power plants.

NAA-SR-MEMO-10625 Field 13H, 18N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP SYSTEMS BRAZE JOINT EXPERIENCE,
by J. R. Crosby. 5 Nov 64, 13p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Brazing, Metal joints), (*Nuclear power plants, Spacecraft).

NAA-SR-MEMO-10729 Field 13K, 20M
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
MERCURY RANKINE PROGRAM THERMOELECTRIC PUMP DATA ANALYSIS AND CORRELATION,
by J. M. Hochman. 17 Nov 64, 16p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Pumps, Thermoelectricity), (*Rankine cycle, Mercury).

OTR-124 Field 13H

National Bureau of Standards, Washington, D. C.
Inst. for Applied Technology.
NONDESTRUCTIVE EVALUATION OF MATERIALS.
Jul 65, 16p Unclassified report

Prepared in cooperation with Syracuse Univ. Research Corp., N. Y.
Available free from CFSTI.

Descriptors: (*Non-destructive testing, Materials), Quality control, Test methods, Hall effect, X-ray diffraction analysis, X-ray photography, Radiography, Gamma-ray spectroscopy, Infrared photography, Ultrasonic radiation, Magnetic fields, Liquids, Penetration, Metals, Alloys, Glass textiles, Ceramic coatings.

Significant reports covering the period since 1962 were selected for this study with references to relevant earlier works. Research described in these reports involves the nondestructive testing and evaluation of metals and other structural materials. The methods investigated included the use of Hall-effect devices, X-ray, infrared, gamma-ray, ultrasonic, electromagnetic and liquid penetrant techniques. Specimens included metals, alloys, fiberglass, and ceramic coatings. (Author)

PB-168 306 Field 13B, 13F, 13M
CFSTI Prices: HC$3.00 MF$0.75

De Leuw, Cather, and Associates, Chicago, Ill.
RAIL RAPID TRANSIT ON THE ALEXANDRIA-SPRINGFIELD ROUTE LAFAYETTE SQUARE TO FOUR MILE RUN.
Final rept.
Mar 63, 90p Unclassified report
Contract NTA30

Original document contains color other than black and white and is available in limited supply. After present stock is exhausted, it will be available in black and white only.

Descriptors: (*Railroads, District of Columbia), (*Civil engineering, Railroads), (*Transportation, District of Columbia), (*Underground structures, Railroads), Urban planning, Urban areas, Virginia, Buildings, Construction, Materials, Costs, Engineering geology, Maps, Feasibility studies.

This report sets forth the results of preliminary engineering studies, estimates of cost and preliminary plans for the proposed facility. Existing base maps and uncontrolled aerial photographs have been used as a basis in development of the alignment. U. S. G. S. maps, supplemented by plans of existing completed facilities within the area of the project, have been used to determine existing ground line and topography. Soils and foundation conditions have been determined through an examination of existing available geological maps and reports, supplemented by available subsurface borings plus ten new borings made specifically in connection with this project. This project will include the use of tunneling, cut-and-cover, open cut and aerial types of structure. Careful consideration has been given to all design details to assure that the physical structures would be aesthetically in keeping with the Capital environs. Design criteria supplied by the National Capital Transportation Agency have been used as a guide in the design of structures, stations, and supporting facilities. Functional plans for stations have been prepared, based on data provided by the National Capital Transportation Agency staff. This study does not include an analysis of trackwork, power supply, power distribution, or signalization.

RPI-2408-1 Field 13H, 11F
CFSTI Prices: HC$1.00 MF$0.50

Rensselaer Polytechnic Inst., Troy, N. Y.
STUDIES OF SINTERING.
Annual rept.,
by Fritz V. Lenel. Feb 65, 15p
Contract AT(30-1)-2408

Unclassified report

Descriptors: (*Sintering, Powder metallurgy), (*Powder metallurgy, Sintering), Transport properties.

14. Methods and Equipment

AD-406 191 Field 14D, 9A
CFSTI Price: HC$3.00

Federal Electric Corp., Paramus, N. J. Engineering and Support Div.
SYSTEM RELIABILITY PREDICTION BY FUNCTION.
Final rept.
15 May 63, 77p
Contract AF30 602 2687, Proj. 5519, Task 551902
RADC TDR-63-146; N63 17421

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Reliability(Electronics), Mathematical prediction), Radar equipment, Radar transmitters, Radar receivers, Multiplex, Communication systems, Data processing systems, Correlation techniques, Factor analysis.

Techniques were developed for predicting the reliability of electronic equipments and systems during the early planning stages. The techniques were based on correlation factors which would relate system, equipment, or sub-equipment functions (radar transmitters for instance) by specific characteristics (such as, peak power) to reliability levels achievable within the existing state-of-the-art. The correlation studies performed were categorized into three areas; radar, ground communication and data processing. A number of applicable radar and ground communication systems were selected for study and definite correlation was found between functional characteristics and actual field MTBF. The results of these correlation studies led to the development of prediction techniques for both the radar and ground communication categories. Verification of these techniques was accomplished by applying them to other systems within the appropriate category and comparing the resultant predictions to those calculated from actual field data. The results proved very satisfactory thus leading to the conclusion that the prediction techniques were sound.

AD-441 260 Field 14B, 9C, 20A
CFSTI Price: HC$1.00

Coast Guard, Baltimore, Md. Field Testing and Development Center.
APPARATUS FOR OUTDOOR TESTING OF SOUND SIGNALS.
4 Jun 64, 23p Rept. no. 382
Proj. 3932 01 01

Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Sound signals, Test equipment(Electronics)), (*Test equipment(Electronics), Sound signals), Test methods, Microphones, Reflection, Ocillographs, Intensity, Sound transmission.

Two techniques for improving the outdoor testing of sound signals were investigated. With the signal and microphone mounted 47 feet above ground, the effect of using a directional microphone to reduce the reflected sound was determined. The report concluded the directional microphone offers definite advantages in outdoor testing. The use of a fast response oscillograph for discriminating between direct and reflected sound was also investigated. The slow rise time of the signal under test made this method impractical in correcting for reflections. (Author)

BDX-613-36 Field 14B, 10C
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
AUTOMATIC MEASURING OF TEMPERATURE COEFFICIENTS. IMPROVEMENTS IN AN AUTOMATIC TESTING DEVICE FOR MEASURING TEMPERATURE COEFFICIENTS OF CAPACITORS,
by Leo A. Schlesselman and Earl M. Sieggen.
Nov 62, 23p Unclassified report
Contract AT-(19-1)-613
Presented to the Mid-America Electronics Convention, Kansas City, Mo. 19-20 Nov 62.

Descriptors: (*Capacitors, Test equipment), (*Thermometers, Test equipment).

BDX-613-57 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Bendix Corp., Kansas City, Mo.
WHAT CAN THE QUALITY ENGINEER EXPECT FROM MEASURING INSTRUMENTS,
by R. W. Butler. Apr 64, 21p Unclassified report
Contract AT(29-1)-613
Presented to the American Society for Quality Control, Albuquerque Section 22 Apr 64.

Descriptors: (*Instrumentation, Measurement).

BNL-867 Field 14B, 18-
CFSTI Prices: HC$6.00 MF$1.25

Brookhaven National Lab., Upton, N. Y.
ANNUAL REPORT, JULY 1, 1964.
1964, 246p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Nuclear physics laboratories, Reports).

BNL-7830 Field 14B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
RANGE AND ERROR OF DENSITOMETERS FOR EMISSION SPECTROSCOPY,
by Morris Slavin. 1960, 9p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Densimeters, Spectroscopy), (*Spectroscopy, Densimeters).

BNWL-6 Field 14B, 18H
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
IRRADIATED TUBE TESTING FACILITY,
by P. M. Jackson. Nov 64, 26p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Test facilities, Radiation damage), (*Pipes, Radiation damage).

BNWL-22 Field 14B, 9B
CFSTI Prices: HC$3.00 MF$0.75

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
INDEX, A COMPUTER PROGRAM FOR INDEXING X-RAY DIFFRACTION POWDER PATTERNS.
by J. B. Goebel and A. S. Wilson. Jan 65, 57p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Programming(Computers), X-ray diffraction analyses), (*X-ray diffraction analyses, Crystals), Powders.

BNWL-51 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest Richland, Wash. Pacific Northwest Lab.
NONDESTRUCTIVE TESTING OF ISOTOPE HEAT SOURCES.
Interim rept.,
by R. W. Steffens, D. R. Green and G. F. Garlick. Apr 65, 29p
Contract AT(45-1)-1830
Unclassified report

Descriptors: (*Non-destructive testing, Radioactive isotopes), Ultrasonic radiation, Infrared radiation, Sources.

IDO-14652 Field 14B
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
INSTRUMENTATION AND CONTROL PRACTICES IN U.S.A. REPROCESSING PLANTS,
by L. A. Jobe. Apr 65, 30p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Material separation, Instrumentation).

LA-3200 Field 14B, 20F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
TECHNIQUES FOR HANDLING ALPHA-ACTIVE SPECIMENS FOR ELECTRON MICROSCOPY,
by Dana L. Douglass. Nov 64, 17p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Electron microscopy, Plutonium alloys), (*Plutonium alloys, Electron microscopy), Handling, Radioactive series.

LA-3211 Field 14B, 20M
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California., N. Mex.
HIGH THERMAL CONDUCTANCE DEVICES UTILIZING THE BOILING OF LITHIUM OR SILVER,
by J. E. Deverall and J. E. Kemme. Oct 64, 33p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Thermal conductivity, Instrumentation).

LA-DC-6396 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
LABORATORY HOOD VENTILATION,
by Robert N. Mitchell and Harry J. Ettinger. 1965, 10p
Unclassified report
Contract W-7405-eng-36

Descriptors: (*Laboratory equipment, Ventilation).

LADC-6436 Field 14B, 14C
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN AUTOMATIC RECORDING MULTIGRADIENT CAPILLARY VISCOMETER,
by J. H. Larkins, J. D. Perrings, and G. R. Shepherd. 1964, 14p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Viscosimeters, Recording systems).

MATT-292 Field 14E
CFSTI Prices: HC$2.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
IMAGE CONVERTER CAMERA FOR 0.5 TO 10,000 MICROSECOND PHOTOGRAPHS,
by H. L. Miller. Oct 64, 29p Unclassified report
Contract AT(30-1)-1238

Descriptors: (*High-speed cameras, Camera tubes), (*Image tubes, Camera shutters).

MLM-1189 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
SHOCK TUBES A BIBLIOGRAPHY. Supplement I.,
by Arnold M. Melnick. 10 Mar 64, 10p
Contract AT-33-1-GEN-53
Unclassified report

Descriptors: (*Shock tubes, Bibliographies).

N65-23287 Field 14B, 22A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Washington, D. C.
INSTRUMENTS OF SPACE,
by G. A. Vacca. 1964, 31p NASA-TM-X-56387
Unclassified report

Presented to the Instr. Soc. of Am., Boston, 2 Nov. 1964.

Descriptors: (*Instrumentation, Astronautics), (*Astronautics, Instrumentation).

N65-24309 Field 14B, 9F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Goddard Space Flight Center, Greenbelt, Md.
TELEMETRY TEST SYSTEM,
by Wallace Goode and Anthony Buige. Mar 65, 12p
NASA-TM-X-55215, X-536-65-127 Unclassified report

Descriptors: (*Telemeter systems, Test equipment), (*Test equipment, Telemeter systems).

N65-25598 Field 14A, 9B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
NASA PERT TIME II,
by Ross C. Bainbridge and Elizabeth Ryan. Jun 65, 19p NASA-TN-D-2863 Unclassified report

Descriptors: (*Management control systems, Programming(Computers)), (*Programming(Computers), Management control systems).

N65-26598 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
FEASIBILITY STUDY OF HIGH-TEMPERATURE SYNTHETIC-AIR HEATER FOR USE WITH A MACH 6 TO 9 HYPERSONIC TUNNEL,
by Erwin A. Lezberg, Steven A. Zlatarich, and Harold G. Price, Jr. Jun 65, 18p NASA-TN-D-2878
Unclassified report

Descriptors: (*Hypersonic wind tunnels, Heaters), (*Heaters, Feasibility studies).

N65-28952 Field 14C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SIGNAL-TO-NOISE RATIOS IN MAGNETIC RECORDING,
by C. J. Creveling. Jul 65, 5p NASA-TN-D-2952
Unclassified report

Descriptors: (*Magnetic recording systems, Signal-to-noise ratio), (*Signal-to-noise ratio, Magnetic recording systems).

NAA-SR-MEMO-10366 Field 14B, 18D
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
RESISTIVITY MEASURING APPARATUS: DESCRIPTION, OPERATION AND SAMPLE TEST RESULTS,
by Dennis Posey. 19 Aug 64, 23p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Resistance(Electrical), Measurement), (*Metals, Resistance(Electrical)).

PB-168 143 Field 14B, 7C
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Cadarache (France). Centre d'Etudes Nucleaires.
DETECTOR FOR THE LIQUID CARRIED OVER IN A GAS (Detecteur d'Entrainement de Liquide Dans un Gaz),
by Jean-Paul Delisle, Paul Eperonnat, and Noel Lions.
Jul 65, 25p Rept. no. CEA-R-2811
Unclassified report

Text in French with attached summary in English.

Descriptors: (*Monitors, Gases), (*Gases, Impurities), (*Oils, Gases), Argon, Mixtures, Tests, France, Optical analysis, Optical equipment.

The report describes an optical detector for the detection of a liquid carried over by a gas. The device is sensible to a cumulated quantity of liquid equal to a few cubic millimetres and is capable of operating an alarm from a distance. The prototype was constructed and tested as detector for the oil leaking in the argon compressed by a diaphragm compressor. (Author)

PB-168 203 Field 14B, 13I
CFSTI Prices: HC$3.00 MF$0.75

Wisconsin Univ., Madison.
PULSE TESTING FOR MACHINE DYNAMICS.
Master's thesis,
by James Alec Bonesho. 1964, 90p
Unclassified report

Available copy will not permit fully legible reproduction.

Descriptors: (*Machine tools, Test methods), Control systems, Dynamics, Frequency, Oscillation.

A method is presented for evaluating the dynamic behavior of machine tool structures.

SC-TM-64-977 Field 14B
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
A TACHOMETER FOR MEASURING RPM USING THE HALL-EFFECT PRINCIPLE,
by D. R. Mackenzie. Aug 64, 10p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Tachometers, Hall effect), (*Hall effect, Tachometers).

15. Military Sciences

No entries

16. Missile Technology

N65-26643 Field 16D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Station.
AERODYNAMIC CHARACTERISTICS OF A FAMILY OF MULTISTAGE MISSILES AT A MACH NUMBER OF 6.0,
by E. Leon Morrisette and David J. Romeo. Jun 65, 29p NASA-TN-D-2853 Unclassified report

Descriptors: (*Guided missiles, Aerodynamic characteristics).

N65-27348 Field 16A
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
A WIND-TUNNEL STUDY OF GROUND-WIND LOADS ON LAUNCH VEHICLES INCLUDING THE EFFECTS OF CONDUITS AND ADJACENT STRUCTURES,
by George B. McCullough, and William J. Steinmetz.
Jul 65, 93p NASA-TN-D-2889

Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Gust loads), (*Gust loads, Launch vehicles(Aerospace)).

UCRL-12271 Field 16D
CFSTI Prices: HC$3.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
DEVELOPING A PAYLOAD FOR A HIGH-ALTITUDE DIAGNOSTIC ROCKET: MECHANICAL ENGINEERING ASPECTS,
by Henry L. Knoll, Karl Kiraly, and John Harri.
1 Mar 65, 55p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Payload, Rockets).

17. Navigation, Communications, Detection, and Countermeasures

N65-17326 Field 17I, 5H
CFSTI Prices: HC$3.00 MF$0.75

Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
A THEORY FOR THE OPTIMAL DETERMINISTIC CHARACTERIZATION OF THE TIME-VARYING DYNAMICS OF THE HUMAN OPERATOR,
by Walter W. Wierwille and Gilbert A. Gagne.
Feb 65, 66p
Contract NAS1 3485
NASA CR-170

Unclassified report

Descriptors: (*Tracking, Performance(Human)).

N65-20617 Field 17B, 20E, 22A
CFSTI Prices: HC$3.00 MF$0.75

Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMMUNICATIONS TO AND FROM LUNAR AND PLANETARY SPACECRAFT.
Preliminary rept. to the Earth-Space Sub-Group 1, Study Group IV, C.C.I.R. includes JPL-TM-33-27 (N63-20963),
by Eberhardt Rechtin. 1961, 76p JPL-TM-33-27
NASA CR-57589

Unclassified report

Descriptors: (*Space communication systems, Masers), (*Masers, Space communication systems).

N65-28738 Field 17G, 22A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
A STUDY OF SOLAR-SYSTEM GEOMETRIC PARAMETERS FOR USE AS INTERPLANETARY NAVIGATION AIDS,
by W. Thomas Blackshear and Katherine G. Johnson.
Jul 65, 35p NASA-TN-D-2890

Unclassified report

Descriptors: (*Space navigation, Interplanetary trajectories), (*Solar systems, Geometry).

N65-28856 Field 17B, 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
TELEVISION TESTS WITH THE SYNCOM II SYNCHRONOUS COMMUNICATIONS SATELLITE,
by Varice F. Henry and Michael E. McDonald.
Jul 65, 16p NASA-TN-D-2911

Unclassified report

Descriptors: (*Television communication systems, Synchronous satellites), (*Communication satellites-(Active), Television communication systems).

18. Nuclear Science and Technology

ANL-6781 Field 18J
CFSTI Prices: HC$4.00 MF$0.75

Argonne National Lab., Ill.
ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF A NUCLEAR REACTOR SUPPORT STRUCTURE,
by A. N. Marchertas, S. H. Fistedie, and R. O. Brittan.
Mar 65, 98p
Contract W-31-109-eng-38

Unclassified report

A portion of this report is a revised version of a Doctoral thesis by A. H. Marchertas.

Descriptors: (*Supports, Nuclear reactors).

ANL-6829 Field 18J, 7A
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
ENGINEERING DEVELOPMENT OF FLUID-BED FLUORIDE VOLATILITY PROCESSES. PART 1. BENCH-SCALE INVESTIGATION OF A PROCESS FOR ZIRCONIUM - URANIUM ALLOY FUEL,
by D. Ramaswami, N. M. Levitz, J. T. Holmes, and A. A. Jonke. Dec 64, 60p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Reactor fuel processing, Fluorination), (*Fluorination, Reactor fuel processing).

ANL-6849 Field 18L, 18J
CFSTI Prices: HC$4.00 MF$1.00

Argonne National Lab., Idaho Falls, Idaho.
EXPERIMENTS ON BOILING CORE B-2, BORAX-V.
Nov 64, 138p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Boiling water reactors, Reactor cores), (*Reactor cores, Boiling water reactors).

ANL-6866 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Idaho Falls, Idaho.
EXPERIMENTAL INVESTIGATIONS OF SECONDARY CRITICAL CONFIGURATIONS (ZPR-III ASSEMBLIES 24 AND 28),
by W. Gemmell, J. K. Long, and W. P. Keeney.
Nov 64, 36p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Fast reactors, Reactor cores), (*Reactor cores, Critical assemblies).

ANL-6901 Field 18J, 7A
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
ENGINEERING DEVELOPMENT OF FLUID-BED FLUORIDE VOLATILITY PROCESSES. PART 5. DESCRIPTION OF A PILOT-SCALE FACILITY FOR URANIUM DIOXIDE - PLUTONIUM DIOXIDE PROCESSING STUDIES,
by G. J. Vogel, E. L. Carls, and W. J. Mecham.
Dec 64, 104p
Contract W-31-109-eng-38
Unclassified report

See also ANL-6902.

Descriptors: (*Reactor fuel processing, Fluorination), (*Fluorination, Reactor fuel processing).

ANL-6939 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Argonne National Lab., Ill.
SELECTION OF THE STRUCTURAL MATERIAL FOR THE PARET LIQUID-METAL SYSTEMS,
by L. R. Kelnan and R. J. Dunworth. Dec 64, 25p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Reactor materials, Liquid metal cooled reactors).

ANL-7010 Field 18K, 18I
CFSTI Prices: HC$7.00 MF$1.50

Argonne National Lab., Ill.
REACTOR PHYSICS DIVISION.
Annual rept. 1 Jul 63-30 Jun 64.
Jan 65, 295p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Nuclear reactors, Nuclear physics), (*Nuclear physics laboratories, Reports), (*Fast reactors, Scientific research), (*Thermal reactors, Scientific research).

ANL-7028 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
REACTOR DEVELOPMENT PROGRAM.
Progress rept, Mar 65.
20 Apr 65, 93p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Nuclear reactors, Scientific research).

ANL-7045 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

Argonne National Lab., Ill.
REACTOR DEVELOPMENT PROGRAM.
Progress rept. for Apr 65.
19 May 65, 77p
Contract W-31-109-eng-38
Unclassified report

Descriptors: (*Reactor operation, Research reactors).

APEX-581 Field 18F
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
SHIELDING TESTS PERFORMED IN THE GENERAL ELECTRIC OUTSIDE TEST TANK IN THE PERIOD MARCH - JUNE 1958,
by S. T. Friedman. Feb 61, 87p
Contract AT(11-1)-171; AF33(600)-38062
Unclassified report

Descriptors: (*Reactor shielding materials, Test methods).

AP-NOTE-351 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
EFFECT OF RADIATION DAMAGE ON THE SERVICE LIFE OF THE SM-1A REACTOR VESSEL,
by H. R. Clayton and D. W. McLaughlin. 29 May 61, 23p
Contract AT(30-1)-2639
Unclassified report

Descriptors: (*Radiation damage, Reactor system components), (*Reactor system components, Radiation damage).

AP-NOTE-395 Field 18I, 18K
CFSTI Prices: HC$2.00 MF$0.50

Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
A STUDY OF POSSIBLE INCREASE OF INITIAL NDT IN THE SM-1 PRESSURE VESSEL WELD HEAT AFFECTED ZONE,
by H. R. Clayton. 26 Mar 62, 34p
Contract AT(30-1)-2639
Unclassified report

Descriptors: (*Reactor system components, Thermal properties), (*Thermal properties, Reactor system components).

AP-NOTE-436 Field 18I
CFSTI Prices: HC$3.00 MF$0.50

Alco Products, Inc., Schenectady, N. Y. Nuclear Power Engineering Dept.
THERMAL STRESS EQUATIONS FOR PM-2A AND SM-1A REACTOR VESSEL MAIN COOLANT NOZZLES,
by B. J. Rowekamp. 18 Jun 62, 51p
Contract AT(30-1)-2639
Unclassified report

Descriptors: (*Thermal stresses, Nozzles), (*Reactor coolants, Nozzles).

BAW-1280-20 Field 18E, 13A
CFSTI Prices: HC$3.00 MF$0.75

Babcock and Wilcox Co., Barberton, Ohio. Boiler Div.
SODIUM-HEATED STEAM GENERATOR DEVELOPMENT.
Progress rept. for Oct 64.
1964, 65p
Contract AT(11-1)-1280
Unclassified report

Descriptors: (*Gas generating systems, Nuclear power plants), Steam power plants.

BAW-1280-21 Field 18E, 13A
CFSTI Prices: HC$3.00 MF$0.75

Babcock and Wilcox Co., Barberton, Ohio. Boiler Div.
SODIUM-HEATED STEAM GENERATOR DEVELOPMENT.
Progress rept. no. 19, Nov 64.
1964, 67p
Contract AT(11-1)-1280
Unclassified report

Descriptors: (*Gas generating systems, Nuclear power plants), Steam power plants.

BAW-3238-6 Field 18I, 20M
CFSTI Prices: HC$2.00 MF$0.50

Babcock and Wilcox Co., Lynchburg, Va. Atomic Energy Div.
NONUNIFORM HEAT GENERATION EXPERIMENTAL PROGRAM.
Quarterly progress rept. no. 6, Oct-Dec 64,
by D. F. Judd, R. H. Wilson, H. S. Swenson, R. A. Lee, and J. W. Ackerman. 1964, 43p
EURAEC-1327
Contract AT(30-1)-3238
Unclassified report

Descriptors: (*Reactor system components, Heat transfer), (*Heat transfer, Reactor system components).

BMI-1707(Del.) Field 18I, 18J, 18L
CFSTI Prices: HC$1.25 MF$0.75

Battelle Memorial Inst., Columbus, Ohio.
PROGRESS RELATING TO CIVILIAN APPLICATIONS DURING DECEMBER 1964,
by Russell W. Dayton and Stan J. Paprocki. 1 Jan 65, 47p
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Reactor materials, Reactor system components), (*Reactor fuels, Nuclear engineering).

BMI-1717 (Del.) Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
PROGRESS RELATING TO CIVILIAN APPLICATIONS DURING FEBRUARY 1965,
by Russell W. Dayton and Stan J. Paprocki.
1 Mar 65, 44p
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Reactor materials, Scientific research), (*Reactor fuels, Scientific research), Reactor materials.

BMI-1720 Field 18J, 20D
CFSTI Prices: HC$1.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
MODEL STUDIES OF FLOW IN PWR CORE 2 FUEL ASSEMBLIES,
by Lawrence J. Flanigan, Clarkson L. Coffin and William D. Beck. 30 Mar 65, 34p Unclassified report
Contract W-7405-eng-92
Descriptors: (*Reactor cores, Fluid flow), (*Reactor fuels, Fluid flow).

BMI-X-10107 Field 18F
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
AN EVALUATION OF THE APPLICABILITY OF EXISTING DATA TO THE ANALYTICAL DESCRIPTION OF A NUCLEAR-REACTOR ACCIDENT.
Quarterly progress rept. for Oct-Dec 64,
by Duane N. Sunderman, David L. Morrison, James A. Gieseke, John C. Smith and Craig T. Walters.
1 Jan 65, 45p EURAEC-1292
Contract W-7405-eng-92
Unclassified report

Descriptors: (*Reactor accidents, Power reactors).

BMI-X-10109 Field 18N
CFSTI Prices: HC$2.00 MF$0.50

Battelle Memorial Inst., Columbus, Ohio.
IRRADIATION OF SNAP SYSTEM ACTUATOR AND POSITION SENSOR ASSEMBLIES IN A VACUUM-NUCLEAR ENVIRONMENT,
by Sam J. Basham, William G. Rieder, William J. Zielenbach, H. Thomas Gruber, and Joseph P. Allgeier. 10 Feb 65, 41p Unclassified report
Contract W-7405-eng-92
Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Nuclear particles).

BNL-909 Field 18L, 5C
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
FACTORS IN THE ECONOMICS OF A SETTLED BED REACTOR,
by Jack Chernick. Sep 64, 37p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Breeder reactors, Economics), (*Economics, Breeder reactors).

BNL-8986 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
MEASUREMENT AND CONTROL OF RADIATION INDUCED GROWTH OF THE BROOKHAVEN GRAPHITE REACTOR,
by Robert M. Singer and Dudley Thompson.
1963, 7p CONF-650602-19
Contract AT(30-2)-GEN-16
Unclassified report
Presented at the American Nuclear Society Annual Meeting (11th), Gatlinburg, Tenn.

Descriptors: (*Graphite moderated reactors, Distortion), (*Radiation damage, Graphite moderated reactors).

BNL-9018 Field 18J, 11F
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A SUMMARY OF THE HIGH-TEMPERATURE ALKALI METAL CORROSION PROGRAM AT BROOKHAVEN NATIONAL LABORATORY,
by A. J. Romano, A. H. Fleitman, and C. J. Klamut.
1963, 22p CONF-650411-3
Contract AT(30-2)-GEN-16

Unclassified report

Presented at the Joint NASA-AEC Liquid Metals Corrosion Meeting, Gatlinburg, Tenn.

Descriptors: (*Refractory metals, Corrosion), (*Liquid metal coolants, Alkali metals), Refractory metal alloys, High-temperature research.

BNWL-3 Field 18K, 20H
CFSTI Prices: HC$3.00 MF$0.50

Battelle-Northwest, Richland, Wash.
Pacific Northwest Lab.
A MONTE CARLO STUDY OF HOMOGENEOUS PLUTONIUM AND URANIUM MIXTURES,
by L. L. Carter and C. R. Richey. Dec 64, 51p
Contract AT(45-1)-1350

Unclassified report

Descriptors: (*Monte Carlo method, Neutron transport theory), (*Plutonium, Uranium).

BNWL-14 Field 18D, 18I
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash.
Pacific Northwest Lab.
INITIAL OPERATING CHARACTERISTICS OF REGENERATING IN-CORE NEUTRON CHAMBERS,
by W. L. Bunch and M. R. Wood. Jan 65, 14p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Neutron counters, Reactor control), (*Reactor control, Neutron counters).

BNWL-25 Field 18G, 18J
CFSTI Prices: HC$3.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
VALUES IN SPENT FUEL FROM POWER REACTORS,
by C. A. Rohrmann. Mar 65, 53p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Reactor fuels, Fission products), (*Fission products, Separation).

BNWL-27 Field 18J, 18F
CFSTI Prices: HC$3.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
BATTELLE-NORTHWEST FUEL FABRICATION EXPERIENCE WITH HIGH-EXPOSURE PLUTONIUM,
by L. G. Merker, L. G. Faust, and W. J. Bailey.
Jan 65, 51p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Reactor fuels, Plutonium), (*Plutonium, Reactor safety systems).

BNWL-28 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
ECONOMIC EVALUATION OF CLOSE-COUPLED FUEL PROCESSING WITH PLUTONIUM RECYCLE,
by R. W. Mckee. Jan 65, 76
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Reactor fuel processing, Costs), (*Plutonium, Reactor fuel processing).

BNWL-38 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash.
Pacific Northwest Lab.
MICROWAVE NEUTRON FLUX MONITORING DEVELOPMENTS.
Progress rept.,
by D. P. Brown and N. S. Porter. Feb 65, 25p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Neutron detectors, Microwave equipment), (*Neutron flux, Reactor control).

BNWL-40 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PRTR FUEL ELEMENT RUPTURE TEST FACILITY CAPABILITIES AND PROJECT HISTORY,
by P. C. Walkup. 1 Mar 65, 29p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Test reactors, Plutonium), (*Reactor fuel elements, Rupture), (*Test facilities, Reactor fuel elements).

BNWL-42 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
POSTIRRADIATION EVALUATION OF ZIRCALOY PRESSURE TUBES FROM KER-1 AND K ER-2.
by R. C. Aungst. Mar 65, 17p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Radiation damage, Pipes), (*Zirconium alloys, Radiation damage), Tin alloys, Reactor system components.

BNWL-45 Field 18J, 18L
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PROMETHIUM-146, FISSION PRODUCT, AND TRANS-URANIUM ISOTOPE CONTENT OF POWER REACTOR FUELS. COMPREHENSIVE CHEMICAL ANALYSES,
by F. P. Roberts and H. H. Van Tuyl. Mar 65, 19p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Reactor fuels, Chemical analysis), (*Power reactors, Reactor fuels).

BNWL-54 Field 18J, 9B
CFSTI Prices: HC$3.00 MF$1.00

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PYRE: A MULTIGROUP BURNUP CODE FOR FAST REACTORS,
by W. W. Little, Jr. and R. W. Hardie. Apr 65, 74p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Fuel burn up, Fast reactors), (*Programming(Computers), Fuel burn up).

BNWL-60 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
FERTF PROGRAM PROGRESS AND PLANS,
Quarterly rept. Jan - Mar 65,
by J. A. Stoddard. Apr 65, 5p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Reactor fuel elements, Rupture), (*Test reactors, Plutonium), (*Test facilities, Reactor fuel elements).

BNWL-67 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
SOLID-STATE ELECTRODIFFUSION IN BISMUTH,
by R. H. Moore. Apr 65, 10p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Bismuth alloys, Plutonium alloys), (*Reactor fuel processing, Plutonium alloys), Diffusion, Bismuth.

BNWL-71 Field 18M
CFSTI Prices: HC$4.00 MF$0.75

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
FAST FLUX TEST FACILITY STUDIES.
Progress rept.,
Ed. by E. R. Astley. Apr 65, 120p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Fast reactors, Test reactors).

BNWL-113-1 Field 18J, 5B
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PLUTONIUM ABSTRACTS. VOLUME 5, NUMBER 1.
10 Feb 65, 16p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Plutonium, Abstracting), (*Abstracting, Plutonium).

BNWL-113-3 Field 18J, 5B
CFSTI Prices: HC$1.00 MF$0.50

Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PLUTONIUM ABSTRACTS. VOLUME 5, NUMBER 3.
30 Apr 65, 21p
Contract AT(45-1)-1830

Unclassified report

Descriptors: (*Plutonium, Abstracting), (*Abstracting, Plutonium).

CEX-59.4.10 Field 18D, 18H
CFSTI Prices: HC$1.00 MF$0.50

Geological Survey, Washington, D. C.
AERORADIOACTIVITY SURVEY AND AREAL GEOLOGY OF THE NATIONAL REACTOR TESTING STATION AREA, IDAHO (ARMS-I),
by Robert G. Bates. Mar 63, 18p

Unclassified report

Descriptors: (*Radiation measurement systems, Airborne), (*Nuclear physics laboratories, Radiation monitors).

CEX-62.6.3 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Edgerton, Germeshausen and Grier, Inc., Santa Barbara, Calif.
ARMS-II: ARGUELLO AREA AERORADIOACTIVITY SURVEY,
by R. B. Guilliou. Dec 62, 22p
Contract AT(29-1)-1183

Unclassified report

Descriptors: (*Radiation measurement systems, Airborne).

CONF-654-53 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Columbia Univ., New York.
NEUTRON BEAM ATTENUATION AS AN OUT-OF-PILE VOID FRACTION DETERMINATION TECHNIQUE FOR BOILING WATER,
by William T. Sha and Charles F. Bonilla. 1963, 21p
AED-CONF-64-219-42
Contract AT(30-3)-187

Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, Calif., 30 Nov-3 Dec 64.

Descriptors: (*Neutron absorbers, Boiling water reactors), (*Boiling water reactors, Reactor moderators).

CONF-641101 Field 18B
CFSTI Prices: HC$3.00 MF$0.75

Division of Isotopes Development (AEC), Washington, D. C.
ISOTOPE SYSTEMS DEVELOPMENT PROGRAM. SIXTH ANNUAL CONTRACTORS MEETING, 9-10 NOVEMBER 1964.
Feb 65, 76p

Unclassified report

Descriptors: (*Radioactive isotopes, Symposia).

CONF-650103-6 Field 18G, 6R
CFSTI Prices: HC$2.00 MF$0.50

Southwest Research Inst., San Antonio, Tex.
INVESTIGATION OF LOW-LEVEL RADIOACTIVE WASTE CONTAINERS IN AN ACCIDENT ENVIRONMENT,
by Joseph E. Minor and Leonard U. Rastrelli.
14 Jan 65, 28p
Contract AT(30-1)-2140

Unclassified report

Presented at International Symposium on Packaging and Transportation of Radioactive Material, Albuquerque, N. Mex.

Descriptors: (*Radioactive waste, Containers).

DLCS-3410122 Field 18H, 18I
CFSTI Prices: HC$2.00 MF$0.50

Duquesne Light Co., Shippingport, Pa.
REACTOR PLANT EXTERNAL RADIATION LEVELS. CORE 1, SEED 4.
Test evaluation.
29 May 64, 23p
Contract AT(11-1)-292

Unclassified report

Descriptors: (*Reactor inspection, Reactor cores), (*Reactor cores, Reactor inspection).

DLCS-3990312 Field 18K, 18I
CFSTI Prices: HC$1.00 MF$0.50

Duquesne Light Co., Shippingport, Pa.
FEDAL SYSTEM. CORE 1, SEED 4.
Test evaluation.
29 May 64, 20p
Contract AT(11-1)-292

Unclassified report

Descriptors: (*Reactor fuel elements, Reactor inspection), (*Reactor inspection, Reactor fuel elements).

DLCS-5001064 Field 18E
CFSTI Prices: HC$2.00 MF$0.50

Duquesne Light Co., Shippingport, Pa.
MONTHLY OPERATING REPORT, OCTOBER 1964.
1964, 35p
Contract AT(11-1)-292

Unclassified report

Descriptors: (*Nuclear power plants, Operation).

DP-933 Field 18H, 7B
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C.
Savannah River Lab.
DETERMINATION OF ZR95 AND NB95 IN MIXTURES OF THE TWO NUCLIDES,
by E. Kenneth Dukes, M. Yates Donnan, and Richard M. Wallace. Feb 65, 15p N65-20709
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Zirconium, Radioactive decay), (*Niobium, Radioactive decay).

DP-942 Field 18G
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C.
Savannah River Lab.
BURNING OF RADIOACTIVE PROCESS SOLVENT,
by D. Whitney Tharin, Jr. Feb 65, 16p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Organic solvents, Radioactive waste), (*Radioactive waste, Disposal).

DP-950 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken S. C.
Savannah River Lab.
NONDESTRUCTIVE TEST OF CARBON BEDS FOR REACTOR CONTAINMENT APPLICATIONS.
Progress rept. for Jul-Sep 64,
by David R. Muhlbaier. Apr 65, 15p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Containment, Carbon), (*Non-destructive testing, Carbon).

DPST-64-83-9 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co. Aiken S. C.
Savannah River Lab.
USAEC - AECL COOPERATIVE PROGRAM.
Monthly progress rept. for Sep 64,
comp. by H. S. Hilborn. 22 Oct 64, 17p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Heavy water reactors, Power reactors) (*Power reactors, Canada).

DPST-64-83-11 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co. Aiken, S. C.
Savannah River Lab.
USAEC-AECL COOPERATIVE PROGRAM.
Monthly progress rept. for Nov 64,
comp. by H. S. Hilborn. 21 Dec 64, 13p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Fuel burn up, Heavy water reactors), (*Reactor fuel rods, Heat transfer).

DPST-64-83-12 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co., Aiken, S. C.
Savannah River Lab.
USAEC-AECL COOPERATIVE PROGRAM.
Monthly progress rept. for Dec 64,
comp. by H. S. Hilborn. 22 Jan 65, 10p
Contract AT(07-2)-1

Unclassified report

Descriptors: (*Heavy water reactors, Power reactors), (*Power reactors, Canada).

DPST-65-83-2 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Du Pont de Nemours (E. I.) and Co. Aiken, S. C.
Savannah River Lab.
USAEC-AECL COOPERATIVE PROGRAM.
Monthly progress rept. for Feb 65,
comp. by H. S. Hilborn. 15 Mar 65, 12p
Contract AT(07-2)-1

Descriptors: (*Heavy water reactors, Power reactors), (*Power reactors, Canada).

EURAEC-703 Field 18G, 20H
CFSTI Prices: HC$5.00 MF$1.00

Societe Belge de Chimie Nucleaire, Brussels.
UNDERGROUND RADIONUCLIDE MOVEMENT.
Final rept. no. 2, 1 Apr 61-31 Mar 63,
by L. Baetale, P. Dejonghe, W. Maes, and P. Staner.
1963, 175p Unclassified report
Contract 048-61-4

Descriptors: (*Radioactive waste, Distribution), (*Elementary particles, Distribution), (*Radioactive waste, Distribution).

EURAEC-1199(Suppl) Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'energie Atomique, Paris, (France).
PLUTONIUM RECYCLING.
Quarterly rept no. 15.
1964, 23p
Contract 037-13-60-12 RDF, Proj. 210
Unclassified report

Descriptors: (*Reactor fuel processing, France), (*Plutonium, Reactor fuel processing).

EURAEC-1215 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Centre d'Etude de l'Energie Nucleaire, Mol (Belgium).
SOLID STATE NEUTRON DETECTOR.
Quarterly rept. no. 4 for 1 Jul-30 Sep 64.
1964, 16p R-2315
Contract 099-63-10R-DB, Proj. 252
Unclassified report

Descriptors: (*Neutron detectors, Solid state physics).

EURAEC-1250 Field 18L
CFSTI Prices: HC$3.00 MF$0.75

Commissariat l'Energie Atomique, Grenoble (France).
Centre d'Etudes Nucleaires.
HYDRODYNAMIC INSTABILITY LIMITING THE POWER OF BOILING WATER REACTORS.
Quarterly rept. no. 2, 1 Apr-30 Jun 64.
15 Jul 64, 84p
Contracts 006-64-1-TEEF; CEA-6435R, Proj. 207
Unclassified report

Descriptors: (*Fluid dynamic properties, Boiling water reactors).

EURAEC-1271 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Commissariat a l'Energie Atomique, Fontenay-Aux-Roses (France). Centre d'Etudes Nucleaires.
PLUTONIUM RECYCLING.
Quarterly rept. no. 16, 1 Jul-30 Sep 64.
1964, 10p
Contract 037-60-12-RDF, Proj. 210
Unclassified report

Descriptors: (*Reactor fuel processing, Plutonium), (*Plutonium, Reactor fuel processing).

EURAEC-1272 Field 18L
CFSTI Prices: HC$2.00 MF$0.50

Commissariat l'Energie Atomique, Grenoble (France).
Centre d'Etudes Nucleaires.
HYDRODYNAMIC INSTABILITY LIMITING THE POWER OF BOILING WATER REACTORS.
Quarterly rept. no. 3, 1 Jul-30 Sep 64.
5 Nov 64, 35p
Contracts 006-64-1-TEEF; CEA-6435R, Proj. 207
Unclassified report

Descriptors: (*Boiling water reactors, Power), (*Fluid dynamic properties, Boiling water reactors).

EURAEC-1302 Field 18K, 9B
CFSTI Prices: HC$2.00 MF$0.50

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Suresnes (France). Division Atomique.
SWIRL FLOWS IN BOILING WATER. CORELO -- A NEUTRONIC CONSTANTS CALCULATION PROGRAM FOR LIGHT WATER AND SLIGHTLY ENRICHED URANIUM OXIDE REACTORS.
Special rept. no. 18,
by G. du Boucheron and J. Martinaud. 4 Feb 65, 29p
Contract 058-61-7-RDF
Unclassified report

Descriptors: (*Boiling water reactors, Light water reactors), (*Reactor kinetics, Programming(Computers)).

EURAEC-1303 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Societe Nationale d'Etude de Construction de Moteurs d'Aviation, Suresnes (France). Division Atomique.
SWIRL FLOWS IN BOILING WATER. STUDY OF AXIAL FLUX DEFORMATION IN A BOILING WATER REACTION WITHOUT CONTROL RODS.
Special rept. no. 19,
by J. Martinaud. 1965, 10p
Contract 058-61-7-RDF
Unclassified report

Descriptors: (*Boiling water reactors, Neutron flux), (*Neutron flux, Deformation).

EURAEC-1318 Field 18H, 11F
CFSTI Prices: HC$2.00 MF$0.50

Societa Richerche Impianti Nucleari, Saluggia (Italy).
Centro Ricerche Nucleari.
INFLUENCE OF NITROGEN IN IRON AND STEEL UNDER FAST NEUTRON IRRADIATION.
Quarterly rept. no. 5, 1 Oct-31 Dec 64,
by F. Rossi. Jan 65, 28p
EUR-2302
Contract 004-63-10-TEEI(RD)
Unclassified report

Descriptors: (*Radiation damage, Iron alloys), (*Fast neutrons, Nitrogen).

EURAEC-1331 Field 18L
CFSTI Prices: HC$1.00 MF$0.50

Societa Elettronucleare Nazionale, Rome (Italy).
RESEARCH PROGRAM FOR THE GARIGLIANO NUCLEAR POWER PLANT.
Rept. no. 3.
1 Jan 65, 10p EUR-2308
Contract 101-63-11-RD I.

Unclassified report

Descriptors: (*Nuclear power plants, Italy).

GAT-P-33 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Goodyear Atomic Corp., Piketon, Ohio.
CAN YOU AFFORD YOUR COOLING WATER TREATMENT PROGRAM,
by D. B. Jones. 30 Jun 64, 17p CONF-492-10
Contract AT(33-2)-1

Unclassified report

Presented at the National Association of Corrosion Engineers (20th), Chicago, Ill. 9-13 Mar 64.

Descriptors: (*Reactor coolants, Processing), (*Water supplies, Costs).

GEAP-4061 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
WATER SURFACE WAVES IN BOILING WATER REACTORS,
by C. L. Howard and R. G. Hamilton. 31 Aug 62, 96p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Boiling water reactors, Water waves), (*Water waves, Boiling water reactors).

GEAP-4640 Field 18J, 18I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SODIUM-COOLED REACTORS PROGRAM. FAST CERAMIC REACTOR DEVELOPMENT PROGRAM.
Quarterly rept. no. 11 for Apr-Jun 64,
ed. by C. E. Breizy. Jul 64, 57p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Fast reactors, Reactor fuels), (*Reactor coolants, Sodium).

GEAP-4723 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
SODIUM-COOLED REACTORS PROGRAM. FAST CERAMIC REACTOR DEVELOPMENT PROGRAM.
Quarterly rept. no. 12 for Jul-Sep 64,
ed. by C. E. Breizy. Oct 64, 89p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Fast reactors, Reactor coolants), (*Reactor coolants, Sodium).

GEAP-4756 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., San Jose, Calif.
Atomic Power Equipment Dept.
FABRICATION AND TESTING OF DISSIMILAR METAL JOINTS FOR THERMAL SPECTRUM SUPERHEAT REACTORS,
by H. J. Busboom and M. E. Snyder. Dec 64, 58p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Thermal reactors, Metal joints), (*Metal joints, Thermal reactors).

GEAP-4759 Field 18I, 18J
CFSTI Prices: HC$5.00 MF$1.25

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
EVESR-NUCLEAR SUPERHEAT FUEL DEVELOPMENT PROJECT.
Quarterly rept. no. 10 for Sep-Nov 64,
by J. L. Murray. Dec 64, 163p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Reactor fuels, Nuclear reactors), (*Nuclear reactors, Reactor fuels).

GEAP-4768 Field 18I
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., San Jose, Calif.
Atomic Power Equipment Dept.
DEVELOPMENT PROGRAM ON THE GARIGLIAND NUCLEAR REACTOR,
by C. L. Howard. 1 Jan 65, 40p EURAEC-1316
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Nuclear reactors, Programming-(Computers)), (*Programming(Computers), Nuclear reactors).

GEAP-4776 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
ACCURATE NUCLEAR FUEL BURNUP ANALYSES.
Quarterly progress rept. no. 12 for Sep-Nov 64,
by B. F. Rider, F. R. Smith, J. L. Jaech, C. P. Ruiz, and J. P. Peterson, Jr. 1 Dec 64, 30p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Reactor fuels, Fuel burn up), (*Fuel burn up, Reactor fuels).

HASL-151 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Health and Safety Lab., New York Operations Office (AEC), N. Y.
DETERMINATICN OF ENERGY DISTRIBUTION OF X-RAY BEAMS FROM A 250 KV CONSTANT POTENTIAL MACHINE,
by Arthur Shambon. Nov 64, 40p
N65 19836

Unclassified report

Descriptors: (*X-rays, Calibration), (*Radiation measurement systems, Calibration).

HASL-158 Field 18H
CFSTI Prices: HC$4.00 MF$2.50

Health and Safety Lab., New York Operations Office (AEC), N. Y.
FALLOUT PROGRAM.
Quarterly summary rept., 1 Dec 64-1 Mar 65,
by Edward P. Hardy, Jr. and Joseph Rivera.
1 Apr 65, 330p
Unclassified report

Descriptors: (*Radioactive fallout, Health physics), (*Health physics, Radioactive fallout).

HASL-159 Field 18H, 4A
CFSTI Prices: HC$4.00 MF$1.25

Health and Safety Lab., New York Operations Office (AEC), N. Y.
CARBON-14 MEASUREMENTS IN THE ATMOSPHERE, 1953 TO 1964,
by P. T. Hagemann, James Gray, Jr., and Lester Machta.
1 Apr 65, 124p
Unclassified report

Descriptors: (*Carbon compounds, Radioactive fallout), (*Radioactive fallout, Carbon compounds).

IDO-10044 Field 18J
CFSTI Prices: HC$3.00 MF$0.75

Babcock and Wilcox Co., Lynchburg, Va. Atomic Energy Div.
PROPOSED LOFT MELTDOWN ANALYSIS TASK II,
by R. J. Walker. Sep 64, 63p BAW-1195-1
Contract AT(10-1)-1195
Unclassified report

Descriptors: (*Reactor cores, Melting).

IDO-10045 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Babcock and Wilcox Co., Lynchburg, Va. Atomic Energy Div.
EVALUATION OF CORE MELTDOWN FOLLOWING LOFT AND PM-2A LOSS-OF-COOLANT ACCIDENTS,
by L. J. Stanek, R. J. Walker, and W. R. Pierce.
Oct 64, 33p BAW-1195-2 Unclassified report
Contract AT(10-1)-1195

Descriptors: (*Reactor cores, Melting), (*Reactor accidents, Reactor coolants).

IDO-10046 Field 18I
CFSTI Prices: HC$3.00 MF$0.75

Babcock and Wilcox Co., Lynchburg, Va. Atomic Energy Div.
LOSS-OF-FLUID TEST FACILITY (LOFT) BLOWDOWN ANALYSIS. PARAMETRIC STUDY OF SYSTEM PRESSURE TRANSIENTS,
by Charles E. Parks. Nov 64, 75p BAW-1195-3
Contract AT(10-1)-1195
Unclassified report

Descriptors: (*Reactor operation, Pressure).

IDO-14608 Field 18G, 17A
CFSTI Prices: HC$4.00 MF$1.00

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
DEVELOPMENT OF FLUIDIZED BED CALCINATION OF ALUMINUM NITRATE WASTES IN THE WASTE CALCINING FACILITY,
by L. T. Lakey, G. E. Lohse, and W. P. Palica.
May 65, 150p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Radioactive waste, Disposal), (*Aluminum compounds, Nitrates), (*Wastes(Industrial), Chemical engineering).

IDO-14638 Field 18J, 7E
CFSTI Prices: HC$0.75 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
CHEMICAL PROCESSING TECHNOLOGY.
Quarterly progress rept. Jan - Mar 64,
by J. A. McBride, J. A. Buckham, and J. R. Huffman.
Jun 64, 34p
Contract AT(10-1)-205
Unclassified report

See also IDO-14635.

Descriptors: (*Reactor fuel processing, Reviews).

IDO-14646 Field 18J, 7A
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
CHEMICAL PROCESSING TECHNOLOGY.
Quarterly progress rept. Apr - Jun 64,
by D. R. de Boisblanc, J. A. McBride, and J. A. Buckham.
Jan 65, 38p N65-19811
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor fuel processing, Reviews).

IDO-16928 Field 18K, 9B
CFSTI Prices: HC$3.00 MF$0.75

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
IREKIN: PROGRAM FOR THE NUMERICAL SOLUTION OF THE REACTOR KINETIC EQUATIONS,
by R. J. Wagner. 1 Mar 63, 78p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor kinetics, Differential equations), (*Programming(Computers), Reactor kinetics).

IDO-17002 Field 18F, 18J, 18K
CFSTI Prices: HC$3.00 MF$0.75

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
ADDENDUM TO THE SPERT IV HAZARDS SUMMARY REPORT: CAPSULE DRIVER CORE,
by R. W. Miller, R. K. McCardell and T. F. Lagier.
Feb 65 80p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor hazards, Reactor cores), (*Reactor cores, Reactor hazards), (*Reactor kinetics, Reactor cores).

IDO-17006 Field 18J, 11C, 11B
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
DIFFUSION IN STABILIZED ZIRCONIA - URANIA SYSTEM,
by D. R. Mash and K. K. Ikeuye. Nov 64, 39p
N65-19661
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Uranium compounds, Diffusion), (*Zirconium compounds, Oxides), Ceramic materials, Reactor fuels.

IDO-17011 Field 18M, 18J
CFSTI Prices: HC$3.00 MF$0.75

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
TRANSIENT TESTS OF THE FULLY ENRICHED, STAINLESS STEEL PLATE-TYPE, P CORE IN THE SPERT I REACTOR,
Data summary rept.,
by A. P. Wing. Dec 64, 65p Unclassified report
Contract AT(10-1)-205
Descriptors: (*Stainless steel, Reactor fuel elements), (*Reactor fuel elements, Stainless steel).

IDO-17019 Field 18N, 18F
CFSTI Prices: HC$4.00 MF$1.00

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
SNAPTRAN 2/10A-3 DESTRUCTIVE TEST RESULTS,
by W. E. Kessler, O. L. Cordes, G. A. Dinneen, R. D. Fletcher, and G. F. Brockett. Jan 65, 136p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Reactor hazards), (*Reactor hazards, Nuclear power plants).

IDO-17037 Field 18J
CFSTI Prices: HC$3.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
ANNUAL PROGRESS REPORT ON REACTOR FUELS AND MATERIALS DEVELOPMENT FOR FY 1964,
by M. J. Graber, W. F. Zelezny, and G. W. Gibson.
Nov 64, 53p Unclassified report
Contract AT(10-1)-205
Descriptors: (*Reactor fuels, Uranium compounds), (*Uranium compounds, Reactor fuels).

IDO-17048 Field 18J, 18K
CFSTI Prices: HC$3.00 MF$0.75

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
FUEL ROD EXPERIENCE DURING THE SPERT I DESTRUCTIVE TEST SERIES WITH A STAINLESS STEEL CLAD, ROD-TYPE CORE.
by J. Dugene and D. D. Wieland. Mar 65, 77p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor fuel rods, Damage), (*Reactor fuel cladding, Stainless steel).

IDO-17064 Field 18I, 18J
CFSTI Prices: HC$1.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho.
Atomic Energy Div.
A SUMMARY OF THE 1962 FUEL ELEMENT FISSION BREAK IN THE MTR,
by J. W. Dykes, J. D. Ford, and K. R. Hoopingarner.
Feb 65, 11p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor fuel plates, Melting), (*Reactor accidents, Test reactors).

IDO-17071 Field 18N, 18F
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
SNAPTRAN 2/10A-3 POST-DESTRUCTIVE TEST REACTOR EXAMINATION, CLEANUP, AND SAFETY CONSIDERATIONS,
by R. D. Fletcher. Jan 64, 43p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Spacecraft, Nuclear power plants), (*Nuclear power plants, Reactor inspection), (*Reactor inspection, Nuclear power plants).

IDO-17084 Field 18F, 18I
CFSTI Prices: HC$2.00 MF$0.50

Phillips Petroleum Co., Idaho Falls, Idaho.
Atomic Energy Div.
SPERT PROJECT.
Quarterly technical rept. for Oct-Dec 64,
ed. by J. G. Crocker. Apr 65, 42p
Contract AT(10-1)-205
Unclassified report

Descriptors: (*Reactor safety systems, Reactor cores), (*Reactor cores, Reactor safety systems).

IS-1012 Field 18B, 18K
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
TRANSIT TIMES AND ELECTRICAL DISCHARGE IN A STEADY-STATE GAS ACTIVATION SYSTEM,
by David Thomas and Willard L. Talbert.
Nov 64, 72p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Isotope separation, Research reactors), (*Gas flow, Isotope separation).

IS-1098 Field 18H
CFSTI Prices: HC$2.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
SURVEY OF ENVIRONMENTAL RADIOACTIVITY,
by Milo D. Voss and Emery E. Sobottka. Dec 64, 35p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Radioactivity, Environmental tests), (*Environmental tests, Radioactivity).

K-1629 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge Gaseous Diffusion Plant, Tenn.
MINIMUM CRITICAL CYLINDER DIAMETERS OF HYDROGEN MODERATED U(4.9) SYSTEMS.
by C. E. Hewlon. 15 Mar 65, 13p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Reactor moderators, Critical assemblies).

KAPL-M-6186 (Rev. 1) Field 18K, 9B
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
KARE INPUT,
by J. L. Fletcher. Aug 64, 45p RPC-12
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Reactor kinetics, Reactor fuels), (*Programming(Computers), Reactor kinetics).

KAPL-M-6420 Field 18K, 18I, 9B
CFSTI Prices: HC$2.00 MF$0.50

Knolls Atomic Power Lab., Schenectady, N. Y.
ETC4A: A ONE DIMENSIONAL MONOENERGETIC TRANSPORT PROGRAM, (REVISION II),
by E. J. Brooks, Jr., C. W. Dawson and T. E. Dudley.
4 Dec 64, 26p EJB-1
Contract W-31-109-eng-52

Unclassified report

Descriptors: (*Neutron transport theory, Neutron flux), (*Programming(Computers), Neutron transport theory).

LA-3150-MS Field 18G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
DISPOSAL OF AM 241 - PU 239 RAFFINATE SOLUTIONS BY FIXATION WITH CEMENT,
by L. A. Emelity, C. W. Christenson, and E. B. Fowler.
Aug 64, 20p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Radioactive isotopes, Disposal).

LA-3183 Field 18J, 11F
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
METALLOGRAPHIC AND ELECTRON MICROSCOPIC EXAMINATIONS OF FLUORIDE FILMS ON URANIA,
by W. P. Ellis and Dana L. Douglass. 1 Sep 64, 51p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Uranium compounds, Fluorination), (*Fluorides, Films).

LA-3188 Field 18J, 7D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE PROCESSING OF PLUTONIUM BY ION EXCHANGE. V. EQUILIBRIUM ANION-EXCHANGE SORPTION FROM MIXED NITRIC ACID - ALUMINUM NITRATE SOLVENTS,
by D. B. James. Sep 64, 15p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Plutonium, Ion exchange), (*Reactor fuel processing, Plutonium).

LA-3194 Field 18L, 18K
CFSTI Prices: HC$4.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CONTROL ROD CALCULATION TECHNIQUES WITH APPLICATIONS TO THE UHTREX REACTOR,
by B. M. Carmichael and E. J. Labauve. 1 Nov 64, 90p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Control rods, Power reactors), (*Power reactors, Control rods).

LA-3209-MS Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
PREPARATION OF TERNARY PLUTONIUM ALLOYS FOR CORE TEST FACILITY PROGRAM,
by J. A. Leary and L. J. Mullins. 9 Nov 64, 13p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Plutonium alloys, Reactor fuels), (*Reactor fuel rods, Plutonium alloys), Reactor fuel processing, Reactor cores.

LA-3217 Field 18J, 11B
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SOLID SOLUTION CARBIDES OF URANIUM AND ZIRCONIUM,
by K. V. Davidson, R. E. Riley, and J. M. Taub.
Nov 64, 34p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Carbides, Solid solutions), (*Reactor materials, Carbides), Uranium compounds, Zirconium compounds.

LA-3219 Field 18K, 21F
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CRITICAL ASSEMBLIES OF FISSIONABLE MATERIALS,
by Carroll B. Mills. Oct 59, 21p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Critical assemblies, Reactor safety systems), (*Nuclear propulsion, Rocket propulsion).

LA-3221-MS Field 18K
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
REACTOR MINIMUM CRITICAL DIMENSIONS,
by Carroll B. Mills. Oct 59, 52p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Critical assemblies, Reactor system components), (*Reactor system components, Configuration).

LA-3242-MS Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
POSSIBLE REMOTE MAINTENANCE AND REPAIRS ON REACTORS AT NRDS,
by W. Charles Wofford. Nov 64, 8p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Reactor operation, Remote control systems).

LA-3244-MS Field 18I, 18J
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
ADVANCED TECHNOLOGY (ART).
Quarterly status rept. for period ending 31 Jan 65,
Feb 65, 55p N65-19535
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Power reactors, Reactor fuels), (*Reactor fuels, Power reactors).

LA-3257-MS Field 18I, 21F
CFSTI Prices: HC$5.00 MF$1.00

Los Alamos Scientific Lab., Univ. of California, N. Mex.
OPTIMAL CONTROL OF NUCLEAR REACTOR PROCESSES.
Doctoral thesis,
by Ronald R. Mohler. Mar 65, 153p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Reactor control, Optimization), (*Nuclear propulsion, Spacecraft).

LA-3279 Field 18F, 18K
CFSTI Prices: HC$4.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
ULTRA HIGH TEMPERATURE REACTOR CRITICAL EXPERIMENT (UCX) SAFETY ANALYSIS REPORT.
Mar 65, 97p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Reactor safety systems, Critical assemblies), (*Critical assemblies, Reactor safety systems).

LA-3316 Field 18J
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
ADVANCED REACTOR TECHNOLOGY (ART).
Quarterly status rept. for period ending 30 Apr 65.
May 65, 49p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Reactor fuels, Plutonium).

LA-DC-6397 Field 18D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
A SEMICONDUCTOR ANTICOINCIDENCE DETECTOR SYSTEM,
by Dale M. Holm and William Mort Sanders. 1964, 10p
CONF-641001-54
Contract W-7405-eng-36
Unclassified report

Presented at the Symposium on Radiochemical Methods of Analysis, Salzburg, Austria.

Descriptors: (*Radiation measurement systems, Semiconductor devices), (*Semiconductor devices, Radiation measurement systems).

LADC-6488 Field 18K, 18I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
NEUTRON PENETRATION FACTORS OBTAINED BY USING ADJOINT TRANSPORT CALCULATIONS,
by G. E. Hansen and H. A. Sandmeier. 1965, 15p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Neutron transport theory, Penetration).

LA-DC-6637 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
STATUS AND APPLICATION OF THERMOLUMINESCENT DOSIMETRY SYSTEMS,
by Edwin A. Bemis. 1964, 33p CONF-727-5
Contract W-7405-eng-36
Unclassified report

Presented at the Annual Bioassay and Analytical Chemistry Meeting No. 10, Cincinnati, Ohio, Oct. 64.

Descriptors: (*Dosimeters, Luminescene).

LA-DC-6669 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N, Mex.
LOS ALAMOS MOLTEN PLUTONIUM PROGRAM,
by D. B. Hall. 1965, 3p CONF-650417-1
Contract W-7405-eng-36
Unclassified report

Presented at the American Nuclear Society National Topical Meeting on Fast Reactor Technology, Detroit, Mich.

Descriptors: (*Plutonium alloys, Reactor fuels), (*Reactor fuels, Fast reactors).

LA-DC-6808 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
PLUTONIUM - CERIUM - COBALT FUEL DEVELOPMENT FOR MOLTEN REACTORS,
by D. R. Harbur, J. W. Romero, and J. W. Anderson.
Jan 65, 26p CONF-650506-1 Unclassified report
Contract W-7405-eng-36
Presented at American Foundrymens Society Meeting, Chicago, Ill.

Descriptors: (*Plutonium alloys, Reactor fuels), (*Reactor fuel rods, Plutonium alloys), Reactor fuel processing.

LA-DC-7050 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE OXIDATION OF REFRACTORY METALS IN LIQUID SODIUM,
by James M. Williams. 1964, 7p CONF-650411-1
Contract W-7405-eng-36
Unclassified report

Presented at the Joint NASA - AEC Liquid Metals Corrosion Meeting, Gatlinburg, Tenn. 21-23 Apr 65.

Descriptors: (*Refractory metals, Oxidation), (*Liquid metals, Refractory metals), Sodium.

LA-DC-7051 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
MASS TRANSFER OF TA IN MOLTEN PU - CO - CE FUELS - THE LINEAR DIFFUSION EXPERIMENT,
by J. C. Biery and C. R. Cushing. 1965, 6p
CONF-650411-2 Unclassified report
Contract W-7405-eng-36
Presented at the Joint NASA - AEC Liquid Metals Corrosion Meeting, Gatlinburg, Tenn. 21-23 Apr 65.

Descriptors: (*Tantalum, Corrosion), (*Plutonium alloys, Reactor fuels), Containers.

MITNE-50 Field 18J, 7D
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge.
EQUILIBRIUM EXTRACTION CHARACTERISTICS OF ALKYL AMINES AND NUCLEAR FUELS METALS IN NITRATE SYSTEMS.
Progress rept. 13, 1 Oct 63-30 May 64,
by Philip J. Lloyd and Edward A. Mason. 3 Aug 64, 33p
Contract W-7405-eng-26 Unclassified report

Descriptors: (*Reactor fuel processing, Chemical equilibrium), (*Amines, Reactor fuel processing).

MITNE-54 Field 18J, 7D
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge.
EQUILIBRIUM EXTRACTION CHARACTERISTICS OF ALKYL AMINES AND NUCLEAR FUELS METALS IN NITRATE SYSTEMS.
Progress rept. 14, 1 Jun-31 Aug 64,
by Philip J. Lloyd and Edward A. Mason. 24 Oct 64, 22p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor fuel processing, Chemical equilibrium), (*Amines, Reactor fuel processing).

MLM-1208 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
REACTOR FUELS AND MATERIALS DEVELOPMENT, PLUTONIUM RESEARCH, APRIL-JUNE 1964,
by L. J. Wittenberg and G. R. Grove.
30 Jun 64, 32p
Contract AT(33-1)-GEN-53 Unclassified report

Descriptors: (*Plutonium alloys, Reactor fuels), (*Reactor fuels, Plutonium alloys), Reactor fuel processing.

MLM-1214 Field 18B
CFSTI Prices: HC$1.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
AN EVALUATION OF THE PHOTOCHEMICAL METHOD OF SEPARATING MERCURY ISOTOPES,
by D. L. Coffey and F. X. Hass. 11 Dec 64, 11p
Contract AT(33-1)-GEN-53
Unclassified report

Descriptors: (*Isotope separation, Photochemistry), (*Mercury, Isotope separation).

MLM-1220 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
REACTOR FUELS AND MATERIALS DEVELOPMENT, PLUTONIUM RESEARCH, JULY-SEPTEMBER 1964,
by L. J. Wittenberg and G. R. Grove.
30 Sep 64, 28p
Contract AT(33-1)-GEN-53
Unclassified report

Descriptors: (*Plutonium alloys, Reactor fuels), (*Reactor fuels, Plutonium alloys), Reactor fuel processing.

MLM-1221 Field 18B
CFSTI Prices: HC$1.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY PROGRESS REPORT FOR OCTOBER 1964,
by J. P. Eichelberger, G. R. Grove, and L. V. Jones.
22 Oct 64, 24p
Contract AT-33-1-GEN-53
Unclassified report

Descriptors: (*Isotope separation, Nuclear physics laboratories), (*Nuclear physics laboratories, Isotope separation).

MLM-1227 Field 18B, 7B, 18D, 11I
CFSTI Prices: HC$2.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY PROGRESS REPORT FOR NOVEMBER 1964,
by J. F. Eichelberger, G. R. Grove, and L. V. Jones.
30 Nov 64, 37p
Contract AT(33-1)-GEN-53
Unclassified report

Descriptors: (*Isotope separation, Reviews), (*Radioactive isotopes, Purification), (*Instrumentation, Reviews), (*Expanded plastics, Epoxy plastics).

MLM-1239 Field 18B
CFSTI Prices: HC$3.00 MF$0.75

Mound Lab., Miamisburg, Ohio.
STATUS OF STABLE GASEOUS ISOTOPE SEPARATION AND PURIFICATION AT MOUND LABORATORY-1963,
by W. J. Haubach, C. F. Eck, W. M. Rutherford, and W. L. Taylor. 31 Dec 63, 80p
Contract AT-33-1-GEN-58
Unclassified report

Descriptors: (*Isotope separation, Gases).

MLM-1247 Field 18D, 18H
CFSTI Prices: HC$1.00 MF$0.50

Mound Lab., Miamisburg, Ohio.
LOW-LEVEL INTERNAL GAS PHASE PROPORTIONAL COUNTING OF KRYPTON-85 IN XENON,
by K. F. Wylie, G. R. Hagee, and R. W. Ostensen.
4 Jun 65, 12p
Contract AT(33-1)-GEN-53
Unclassified report

Descriptors: (*Krypton, Radioactive isotopes), (*Proportional counters, Operation).

MMPP-FRPC-64-1 Field 18K, 18I
CFSTI Prices: HC$3.00 MF$0.75

Michigan Univ., Ann Arbor, Dept. of Nuclear Engineering.
RECENT APPLICATIONS OF NEUTRON TRANSPORT THEORY,
by P. F. Zweifel. 1964, 65p CONF-640615-1
Contract AT(11-1)-1372
Unclassified report

Presented at the Fast Reactor Physics Conference, Ann Arbor, Mich. 8-12 Jun 64.

Descriptors: (*Neutron transport theory, Nuclear reactors), (*Nuclear engineering, Neutron transport theory).

MSAR-64-126 Field 18J, 11F
CFSTI Prices: HC$2.00 MF$0.50

MSA Research Corp., Callery, Penna.
EFFECT OF HIGH-TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 50, Oct 64.
11 Nov 64, 26p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), High-temperature research, Stainless steel.

MSAR-64-144 Field 18J, 11F
CFSTI Prices: HC$2.00 MF$0.50

MSA Research Corp., Callery, Penna.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. 51, Nov 64.
15 Dec 64, 28p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), High-temperature research, Stainless steel.

MSAR-65-05 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

MSA Research Corp., Callery, Penna.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 52, Dec 64.
15 Jan 65, 30p
Contract AT(11-1)-765 Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), Corrosion, High-temperature research, Stainless steel.

MSAR-65-28 Field 18J, 11F
CFSTI Prices: HC$2.00 MF$0.75

MSA Research Corp., Callery, Pa.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 53, Jan 65.
24 Feb 65, 42p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), High-temperature research, Stainless steel.

MSAR-65-38 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

MSA Research Corp., Callery, Pa.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 54, Feb 65.
16 Mar 65, 26p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Mechanical properties), (*Sodium, Steel), Liquid metals, High-temperature research, Stainless steel.

MSAR-65-47 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

MSA Research Corp., Callery, Pa.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 55, Mar 65.
13 Apr 65, 15p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), Liquid metal coolants, Liquid metals, High-temperature research, Stainless steel, Reactor materials.

MSAR-65-62 Field 18J, 11F
CFSTI Prices: HC$1.00 MF$0.50

MSA Research Corp., Callery, Pa.
EFFECT OF HIGH TEMPERATURE SODIUM ON AUSTENITIC AND FERRITIC STEELS. PHYSICAL PROPERTIES OF MATERIALS.
Progress rept. no. 56, Apr 65.
13 May 65, 14p
Contract AT(11-1)-765
Unclassified report

Descriptors: (*Steel, Compatibility), (*Sodium, Liquid metals), High-temperature research, Stainless steel.

NAA-SR-8714 Field 18K, 18L
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
NUCLEAR INSTRUMENT ANOMALIES DURING RISE-TO-POWER TESTING AT THE HALLAM NUCLEAR POWER FACILITY,
by J. Cashetta. 13 Jul 63, 47p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Reactor start-up sources, Power reactors).

NAA-SR-9213 (vol. 1) Field 18I
CFSTI Prices: HC$7.00 MF$1.50

Atomics International, Canoga Park, Calif.
1000-MWE SGR AND PROTOTYPE EVALUATION STUDY. VOLUME I. LARGE SGR DESIGN BASES, ECONOMICS, AND DEVELOPMENT PROGRAM.
Dec 63, 308p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Sodium graphite reactions, Test methods).

NAA-SR-9213 (Vol.2) Field 18I
CFSTI Prices: HC$7.00 MF$1.75

Atomics International, Canoga Park, Calif.
1000-MWE SGR AND PROTOTYPE EVALUATION STUDY. VOLUME 2. 200-MWE SGR PROTOTYPE PRELIMINARY DESIGN.
Dec 63, 391p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Sodium graphite reactors, Test method).

NAA-SR-9213(Suppl.) Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
1000-MWE SGR AND PROTOTYPE EVALUATION STUDY.
Jul 64, 21p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Sodium graphite reactors, Test method).

NAA-SR-9335 Field 18J, 18I
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
COMPARATIVE FUEL CYCLE EVALUATIONS, LOW DECONTAMINATION PYROPROCESSING, AND AQUEOUS REPROCESSING, PART II. UC FUEL IN A THERMAL REACTOR,
by K. L. Mattera and L. J. Colby, Jr.
15 Feb 65, 41p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Fuel burn up, Thermal reactors), (*Reactor fuel processing, Thermal reactors).

NAA-SR-9600 Field 18N, 18J
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
NONDESTRUCTIVE DETERMINATION OF U 235 CONTENT OF SNAP FUEL RODS. VOL. III. EQUIPMENT DESCRIPTION AND PRODUCTION QUALITY CONTROL APPLICATIONS,
by A. R. Mooers and R. C. Barry. 15 May 65, 28p
Contract AT(11-1)-GEN-8

Unclassified report

See also NAA-SR-9600, Vol. II.

Descriptors: (*Uranium, Non-destructive testing), (*Reactor fuel rods, Non-destructive testing).

NAA-SR-9780 Field 18N, 18F
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
ANALYSIS OF SNAPTRAN-3 DESTRUCTIVE EXPERIMENT,
by K. E. Buttrey, L. I. Moss, and D. F. Paddleford. 1 Feb 65, 82p
Contract AT-(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Reactor safety systems), (*Reactor safety systems, Reactor reactivity).

NAA-SR-9826 Field 18L
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
FINAL DESIGN OF SODIUM-HEATED, MODULAR, STEAM GENERATORS FOR THE SCII,
by D. F. Casey, J. J. D. Logan, M. C. Williams, and J. J. Hammer. 1 Feb 65, 100p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Power reactors, Steam).

NAA-SR-9894 Field 18N
CFSTI Prices: HC$2.50 MF$1.00

Atomics International, Canoga Park, Calif.
DEVELOPMENT OF HIGH-TEMPERATURE ELECTRICAL GROUND TEST HEATERS FOR THE SNAP-10A PROGRAM,
by R. Blevitt, G. Paine and S. Sudar. 1 Mar 65, 128p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Heaters, Nuclear power plants).

NAA-SR-9967 Field 18K, 20H
CFSTI Prices: HC$3.00 MF$0.50

Atomics International, Canoga Park, Calif.
FLUX CONTROL FOR IRRADIATION EXPERIMENTS,
by W. K. McCarty. 1 Feb 65, 51p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Neutron flux, Reactor control), (*Reactor control, Neutron flux).

NAA-SR-10284 Field 18H, 18I, 18N
CFSTI Prices: HC$4.00 MF$1.00

Atomics International, Canoga Park, Calif.

LOW FLUX NUCLEAR RADIATION EFFECTS ON ELECTRONIC COMPONENTS (BMI-LF-2),
by M. N. Robinson, S. G. Kimble, N. F. Davies, and D. M. Walker. 20 Apr 65, 145p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Radiation damage, Electronic equipment), (*Reactor control, Electronic equipment).

NAA-SR-10318 Field 18N, 22B
CFSTI Prices: HC$2.25 MF$0.75

Atomics International, Canoga Park, Calif.
APPLICATION OF NUCLEAR POWER PLANTS (SNAP UNITS) TO THE MANNED ORBITING RESEARCH LABORATORY (MORL),
by W. V. Botts, M. Marko, P. E. McCourt, G. S. Budney, and V. Keshishian. 1 Feb 65, 91p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Space stations), (*Space stations, Laboratories).

NAA-SR-10379 Field 18L
CFSTI Prices: HC$1.25 MF$0.75

Atomics International, Canoga Park, Calif.
SODIUM REACTOR EXPERIMENT. POWER EXPANSION PROGRAM-HEAT TRANSFER SYSTEMS MODIFICATIONS,
ed. by W. J. Freede and J. K. Roberts. 9 Oct 64, 53p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Power reactors, Heat transfer), (*Sodium graphite reactors, Power reactors).

NAA-SR-10511 Field 18D, 14D
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
INCREASING THERMOCOUPLE RELIABILITY FOR IN-PILE EXPERIMENTS,
by E. L. Babbe. 20 Apr 65, 42p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Thermocouples, Reliability), (*Research reactors, Thermocouples).

NAA-SR-10850 Field 18I, 18J
CFSTI Prices: HC$6.00 MF$1.50

Atomics International, Canoga Park, Calif.
AEC UNCLASSIFIED PROGRAMS.
Quarterly technical progress rept. Oct-Dec 64,
15 Feb 65, 268p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear reactors, Scientific research), (*Reactor fuels, Scientific research).

NAA-SR-10899 Field 18K, 18N, 20H
CFSTI Prices: HC$3.00 MF$0.50

Atomics International, Canoga Park, Calif.
AN INTRODUCTORY SURVEY OF THERMALIZATION THEORY FOR ZIRCONIUM HYDRIDE,
by W. J. Roberts. 20 Apr 65, 50p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Thermal neutrons, Neutron scattering), (*Zirconium compounds, Hydrides).

NAA-SR-11129 Field 18N, 22B
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP-10A FSEM-3 AGENA COMPATIBILITY TEST,
by M. Teresa. 15 Jun 65, 39p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Compatibility), (*Spacecraft, Nuclear power plants).

NAA-SR-MEMO-7837 Field 18J
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
LEAK CHECK OF MODERATOR ELEMENTS IN THE HNPF REACTOR,
by Jim Mowrey. 19 Dec 62, 10p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Reactor moderators, Reactor safety systems).

NAA-SR-MEMO-7891 Field 18K
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
MULTIGROUP CALCULATION METHODS WITH APPLICATION TO THE SGR CRITICAL EXPERIMENT,
by F. L. Fillmore. 1 Sep 64, 69p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Critical assemblies, Graphite moderated reactors), (*Graphite moderated reactors, Fast fission factor).

NAA-SR-MEMO-9492 Field 18J, 20M
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
COMPUTER CALCULATION OF FUEL CLADDING TEMPERATURES, HEAT FLUXES AND POWER DISTRIBUTION IN THE PNPF CORE,
by D. F. Hausknecht. 4 Apr 64, 69p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Reactor fuel cladding, Temperature), (*Reactor cores, Thermal properties).

NAA-SR-MEMO-9824 Field 18N, 13K
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A PBSNTE T/E PUMP S/N-013 ACCEPTANCE TEST,
by T. M. Funakura. 20 Apr 64, 18p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-9945 Field 18K, 11F
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif. Ark, Calif.
CRITICALITY STUDY, 20 W/O U - ZR ALLOY FUEL,
by N. Ketzlach and V. Warner. 22 Sep 64, 35p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: Critical assemblies, Reactor fuels), (*Uranium alloys, Zirconium alloys).

NAA-SR-MEMO-9976 Field 18J
CFSTI Prices: HC$3.00 MF$1.00

Atomics International, Canoga Park, Calif.
EXPONENTIAL EXPERIMENTS TO DETERMINE MATERIAL BUCKLING FOR UC FUELED GRAPHITE MODERATED ASSEMBLIES,
by O. R. Hillig, E. J. Johnson, and V. A. Swanson.
25 Jun 64, 100p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Graphite moderated reactors, Reactor materials), (*Buckling(Neutron density), Graphite moderated reactors).

NAA-SR-MEMO-10224 Field 18I
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
WETTING OF MERCURY-RANKINE BOILER TUBE SURFACES,
by I. E. Randell. 16 Jul 64, 28p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Boiler tubes, Surface properties), (*Mercury, Boiler tubes), Cleaning, Pickling, Heat treatment.

NAA-SR-MEMO-10286 Field 18N, 9A
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
QUALIFICATION TEST OF SNAP 10A RELAYS, 10FS-24008 AND 10FS-24010,
by J. Lowensen and M. Christian. 1 Sep 64, 71p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Relays, Nuclear power plants).

NAA-SR-MEMO-10317 Field 18N, 13K
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNA' 10A PBSNTE T/EPUMP S/N-031 ACCEPTANCE TEST,
by C. M. Quirk and T. M. Funakura. 19 Aug 64, 28p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-10421 Field 18K, 18N
CFSTI Prices: HC$3.00 MF$1.00

Atomics International, Canoga Park, Calif.
A METHOD OF CALCULATING ANNULAR VOID REACTIVITY EFFECTS IN CYLINDRICAL REACTORS,
by R. H. Norman, D. G. Oliver, and W. R. Castle.
9 Sep 64, 87p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Reactor reactivity, Nuclear power plants), (*Nuclear power plants, Spacecraft).

NAA-SR-MEMO-10457 Field 18J, 18N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
MODULUS OF RUPTURE AND TENSILE STRENGTH OF SIGE ALLOYS,
by G. G. Bentle and R. M. Kniefel. 17 Sep 64, 8p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Silicon alloys, Tensile properties), (*Germanium alloys, Rupture), Semiconductors, Failure(Mechanics).

NAA-SR-MEMO-10480 Field 18N, 13K
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A PBSNTE T/E PUMP S/N-034 ACCEPTANCE TEST,
by C. M. Quirk and T. M. Funakura. 25 Sep 64, 27p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Pumps, Nuclear power plants).

NAA-SR-MEMO-10494 Field 18I, 9B
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif. Ark, Calif.
DRUM CONTROLLER SIMULATION ON AN ANALOG COMPUTER,
by L. N. Wimberly. Oct 64, 10p Unclassified report
Contract AT(11-1)-GEN-8
Descriptors: (*Reactor control, Simulation), (*Analog computers, Simulation).

NAA-SR-MEMO-10512 Field 18K, 20M
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
COLUMBIA UNIVERSITY BOILING WATER HEAT TRANSFER EXPERIMENTS WITH TWELVE-ROD TEST SECTIONS.
Status rept.,
by T. J. Sadowski. 29 Sep 64, 21p
Contract AT(11-1)-GEN-8 Unclassified report

Descriptors: (*Boiling water reactors, Heat transfer).

NAA-SR-MEMO-10529 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
PREPARATION AND TRANSPORTATION OF PIQUA FUEL ELEMENTS.
Summary rept.,
by K. E. Neff. 12 Oct 64, 32p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Reactor fuel elements, Reactor fuel processing), (*Reactor fuel processing, Transportation).

NAA-SR-MEMO-10532 Field 18N, 9A
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
EVALUATION TESTING OF FILTORS DPDT RELAYS,
by M. W. Christian. 7 Oct 64, 20p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Relays, Nuclear power plants).

NAA-SR-MEMO-10557 (pt 1) Field 18D, 9B
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
MONTE CARLO EVALUATION OF COLLIMATOR EFFICIENCY. PART I. DESCRIPTION OF THE CLUB COMPUTER CODE,
by W. B. Green and R. S. Hubner. 13 Oct 64, 32p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Collimators, Neutron beams), (*Monte Carlo method, Programming(Computers)).

NAA-SR-MEMO-10557 (pt 2) Field 18D, 9B
CFSTI Prices: HC$3.00 MF$0.75

Atomics International, Canoga Park, Calif.
MONTE CARLO EVALUATION OF COLLIMATOR EFFICIENCY. PART 2. LISTING OF THE CLUB CODE,
by W. B. Green and R. S. Hubner. 26 Oct 64, 56p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Collimators, Neutron beams), (*Monte Carlo method, Programming(Computers)).

NAA-SR-MEMO-10559 Field 18F
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
ANALYSIS OF SHIELD TEST FACILITY EXPERIMENTS USING THE TWO COMPONENT METHOD,
by W. B. Green. 13 Oct 64, 10p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Reactor shielding calculations, Test methods).

NAA-SR-MEMO-10584 Field 18F, 20H
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
RESULTS OF THE ANALYSIS OF EXPERIMENTS ON FAST NEUTRON TRANSMISSION IN LIH,
by R. S. Hubner. 4 Nov 64, 6p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Neutron transport theory, Monte Carlo method), (*lithium compounds, Hydrides).

NAA-SR-MEMO-10593 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
A SUMMARY OF SRE SODIUM SYSTEMS EXPOSURE HISTORY,
by F. H. Dunbar. 22 Oct 64, 23p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Sodium graphite reactors, Critical assemblies).

NAA-SR-MEMO-10596 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
DETECTION AND IDENTIFICATION OF FAILED MODERATOR ELEMENTS IN THE HNPF CORE FROM OPERATING DATA,
by R. M. Mills. 22 Oct 64, 50p Unclassified report
Contract AT(11-1)-GEN-8
Descriptors: (*Reactor moderators, Malfunctions).

NAA-SR-MEMO-10666 Field 18N
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
SNAP 10A MALFUNCTION DETECTION SUBSYSTEM: OPERATION AND ANALYSIS,
by L. E. Fort, G . Drucker, and B. R. Wade. 2 Nov 64, 38p Unclassified report
Contract AT(11-1)-GEN-11
Descriptors: (*Nuclear power plants, Spacecraft), (*Malfunctions, Nuclear power plants).

NAA-SR-MEMO-10704 Field 18N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
STATIC STRUCTURAL TEST OF THE ALUMINUM - STEEL RADIATOR CONDESNER (R/C-10),
by W. P. Engle. 12 Nov 64, 25p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Nuclear power plants, Spacecraft), (*Radiators, Aerodynamic loading).

NAA-SR-MEMO-10767 Field 18N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
TEST CONTROL DEVICES: SNAP 10A VIBRATION TEST PROGRAM,
by R. M. Olive and E. L. Gardner. 10 Dec 64, 13p
CONF-641020-1
Contract AT(11-1)-GEN-8 Unclassified report

Presented at the Symposium on shock, vibration, and associated environments (34th), Pacific Grove, Calif.

Descriptors: (*Nuclear power plants, Spacecraft), (*Vibration, Nuclear power plants).

NAA-SR-MEMO-10922 Field 18F, 9B
CFSTI Prices: HC$3.00 MF$0.50

Atomics International, Canoga Park, Calif.
SHOE: A SHIELD WEIGHT OPTIMIZATION CODE,
by R. L. Bernick. 15 Jan 65, 59p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Reactor shielding calculations, weight), (*Programming(Computers), Reactor shielding calculations).

NUMEC-3428-9 Field 18J, 13H
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Materials and Equipment Corp., Apollo, Pa.
GROWTH OF SINGLE CRYSTALS OF PLUTONIUM.
Quarterly progress rept., 1 Jan-31 Mar 65,
1965, 9p
Contract AT(30-1)-2389
Unclassified report

Descriptors: (*Plutonium, Crystal growth), (*Crystal growth, Plutonium), Plutonium alloys, Single crystals.

NUMEC-3432-6 Field 18J, 14B
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Materials and Equipment Corp., Apollo, Pa.
IRRADIATION TESTING OF U02 - PU02 FUELS.
Quarterly progress rept. 1 Oct-31 Dec 64.
1964, 6p
Contract AT(30-1)-3432
Unclassified report

Descriptors: (*Radiation damage, Reactor fuels), (*Reactor fuels, Ceramic materials), Plutonium compounds, Uranium compounds, Oxides.

NUMEC-3432-7 Field 18J
CFSTI Prices: HC$4.00 MF$0.75

Nuclear Materials and Equipment Corp., Apollo, Pa.
DATA PACKAGE FOR NUMECS IRRADIATION TESTING PROGRAM. CAPSULES NU-17, NU-18, AND NU-19.
8 Feb 65, 101p
Contract AT(30-1)-3432
Unclassified report

Descriptors: (*Reactor fuels, Ceramic materials), (*Oxides, Reactor fuels), Fast reactors, Plutonium compounds, Uranium compounds.

ORNL-3209 Field 18L
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
A COMPARISON OF GAS-TURBINE AND STEAM-TURBINE POWER PLANTS FOR USE WITH ALL-CERAMIC GAS-COOLED REACTORS,
by A. P. Fraas and M. N. Ozisik. Jul 65, 62p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Turbines, *Gas-cooled reactors), (*Gas-cooled reactors, Turbines).

ORNL-3704 Field 18F, 18J
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
HIGH-DENSITY CONCRETE FOR GAMMA AND NEUTRON ATTENUATION,
by T. E. Northup. Mar 65, 72pN65-19654
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor shielding materials, Gamma rays), (*Concrete, Reactor shielding materials), Neutron absorbers.

ORNL-3739 Field 18J, 7B, 11F
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
TRANSURANIUM.
Quarterly progress rept. for period ending 31 Aug 64,
comp. by W. D. Burch. May 65, 79p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Actinide series, Reviews), (*Reactor materials, Actinide series).

ORNL-3812 Field 18J
CFSTI Prices: HC$5.00 MF$1.00

Oak Ridge National Lab., Tenn.
MOLTEN-SALT REACTOR PROGRAM.
Semiannual progress rept. for period ending 28 Feb 65.
Jun 65, 185p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor materials, Salts).

ORNL-P-993 Field 18D
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE RESPONSE OF SOME ORGANIC SCINTILLATORS TO FAST NEUTRONS,
by V. V. Verbinski, J. C. Courtney, and W. R. Burrus.
1964, 40p CONF-654-34
Contract W-7405-eng-26
Unclassified report

Presented at the American Nuclear Society Meeting, San Francisco, Calif, Nov-Dec 64.

Descriptors: (*Scintillation counters, Organic materials), (*Fast neutrons, Scintillation counters).

ORNL-P-1154 Field 18G
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
POLICY AND PROCEDURES USED IN THE UNITED STATES FOR DECONTAMINATING HOT CELLS,
by Clyde D. Watson, Ernest A. Berreth, and Jerome E. Dummer. 1965, 19p CONF-650604-3
Contract W-7405-eng-26
Unclassified report

Presented at the International Symposium on Working Methods in High Activity Hot Labs., Grenoble, France, 15-18 Jun 65.

Descriptors: (*Decontamination, Standards).

ORNL-TM-995 Field 18J, 13K
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DEVELOPMENT OF AN AIR-OPERATED, METAL-DIAPHRAGM PUMP FOR THE TRANSURANIUM PROCESSING FACILITY,
by T. S. Mackey. 16 Oct 64, 21p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor fuel processing, Pumps), (*Pumps, Reactor fuel processing).

ORNL-TM-1022 Field 18K
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
BOUNDARY CONDITIONS FOR THE CYLINDRICALIZED CELL OF REACTOR LATTICE CALCULATIONS,
by J. Wallace Webster. 30 Dec 64, 14p
Contract W-7405-eng-26
Unclassified report

Descriptors: (*Reactor lattice parameters, Boundary valve problems).

ORNL-TM-1096 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
BURN-LEACH PROCESSES FOR GRAPHITE-BASE REACTOR FUELS CONTAINING CARBON-COATED CARBIDE OR OXIDE PARTICLES,
by E. L. Nicholson, L. M. Ferris, and J. T. Roberts.
2 Apr 65, 26p CONF-650606-1
Contract W-7405-eng-26
Unclassified report

Presented at the Euratom Symposium on Fuel Cycles of High-temperature Gas-cooled Reactors, Brussels, Belgium 10-11 Jun 65.

Descriptors: (*Reactor fuel processing, Effectiveness).

ORNL-TM-1111 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
FUEL CYCLES FOR HIGH-TEMPERATURE GAS-COOLED REACTORS UTILIZING PLUTONIUM,
by R. S. Carlsmith and W. E. Thomas.
14 Apr 65, 11p CONF-650606-2 Unclassified report
Contract W-7405-eng-26
Presented at the Euratom Symposium on Fuel Cycles of High-temperature Gas-cooled Reactors, Brussels, Belgium 10-11 Jun 65.

Descriptors: (*Fuel burn up, Gas-cooled reactors), (*Gas-cooled reactors, Fuel burn up).

ORNL-TM-1112 Field 18I
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
FUEL-CYCLE COST COMPARISONS FOR HIGH-TEMPERATURE GAS-COOLED REACTOR FUELS,
by R. S. Carlsmith, C. M. Podewaltz, and W. E. Thomas.
14 Apr 65, 18p CONF-650606-3 Unclassified report
Contract W-7405-eng-26
Presented at the euratom symposium on fuel cycles of high-temperature gas-cooled reactors, Brussels, Belgium 10-11 Jun 65.

Descriptors: (*Fuel burn up, Gas-cooled reactors), (*Gas-cooled reactors, Fuel burn up).

PNE-218F Field 18D, 18C
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
RADIOACTIVE PELLET TRAJECTORY STUDY,
by J. Allen. Apr 65, 36p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Cratering, Nuclear explosions), (*Particle trajectories, Cratering).

SC-TM-64-1791 Field 18B
CFSTI Prices: HC$2.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
CALIBRATION OF THE SANDIA LABORATORY 10,000 CURIE COBALT-60 GAMMA IRRADIATION FACILITY,
by Louis H. Sanders and Irving Auerbach. Feb 65, 29p
Contract AT(29-1)-789
Unclassified report

Descriptors: (*Radioactive isotopes, Cobalt), (*Cobalt, Calibration).

TEI-858 Field 18H, 8G
CFSTI Prices: HC$3.00 MF$0.75

Geological Survey, Washington, D. C.
SUBSURFACE MEASUREMENTS OF NATURAL GAMMA RADIOACTIVITY, NEVADA TEST SITE AND VICINITY, NYE, LINCOLN, AND CLARK COUNTIES, NEVADA,
by Carl M. Bunker. Mar 65, 74p
Unclassified report

Descriptors: (*Natural radioactivity, Rock(Geology)), (*Petrology, Natural radioactivity).

TID-3086 (Sup 2) Field 18H
CFSTI Prices: HC$6.00 MF$1.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
RADIOACTIVE FALLOUT. A BIBLIOGRAPHY OF THE WORLDS LITERATURE.
Comp. by William E. Bost and Hugh E. Voress.
Feb 65, 272p
Unclassified report

Descriptors: (*Radioactive fallout, Bibliographies).

TID-3522 Field 18C
CFSTI Prices: HC$2.00 MF$0.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
PEACEFUL USES FOR NUCLEAR EXPLOSIVES. A SELECTED ANNOTATED BIBLIOGRAPHY,
comp. by Hugh E. Voress and Carl R. Gerber.
Apr 65, 36p Unclassified report

Descriptors: (*Nuclear explosions, Bibliographies).

TID-7698 (Pt 1) Field 18E, 18N, 18B
CFSTI Prices: HC$6.00 MF$1.50

Division of Isotopes Development (AEC), Washington, D. C.
CONFERENCE ON ISOTOPIC POWER DEVELOPMENT, GERMANTOWN, MARYLAND, 18-19 MAY 64.
1964, 284p
Unclassified report

Descriptors: (*Nuclear energy, Propulsion), (*Isotopes, Nuclear power plants).

TID-21330 Field 18B
CFSTI Prices: HC$1.00 MF$0.50

National Lead Co. of Ohio, Cincinnati.
EXPERIENCES IN BLENDING FOR ISOTOPIC ADJUSTMENT,
by W. E. Shaw. 12 Oct 64, 20p
Contract AT(30-1)-1156 Unclassified report
N65 19803
Descriptors: (*Radioactive isotopes, Mixtures).

TID-21373 Field 18I, 18J
CFSTI Prices: HC$1.00 MF$0.50

Columbia Univ., New York. Engineering Research Labs.
EVALUATION OF THE EFFECT OF THE TEMPERATURE DEPENDENT HEAT GENERATION RATE ON THE BURNOUT RESULTS FOR THE UNIFORM AND COSINE HEAT FLUX TEST SECTIONS.
Topical rept. no. 3,
by B. Matzner and F. Castellana. 23 Oct 64, 22p
Contract AT(30-3)-187
Unclassified report

USAEC/AECL Cooperative program on heavy water moderated power reactors.

Descriptors: (*Heavy water reactors, Heat transfer), (*Heat transfer, Heavy water reactors).

UR-658 Field 18H
CFSTI Prices: HC$3.00 MF$0.75

Rochester Univ., N. Y. Atomic Energy Project.
A METHOD OF ANALYSIS OF AIR SAMPLING DATA FOR PARTICULATE ALPHA EMITTERS IN A RADON - THORON DAUGHTER ATMOSPHERE,
by Otto G. Raebe and Fred S. Patterson.
28 Aug 64, 92p Unclassified report
Contract W-7401-eng-49
Descriptors: (*Air, Analysis), (*Alpha particles, Air).

WAPD-MRP-112 Field 18E
CFSTI Prices: HC$2.50 MF$1.00

Bettis Atomic Power Lab., Pittsburgh, Pa.
PRESSURIZED WATER REACTOR (PWR) PROJECT.
Technical progress rept. 24 Jan-23 Apr 65.
1965, 103p Unclassified report
Contract AT(11-1)-GEN-14
Descriptors: (*Pressurized water reactors, Nuclear power plants).

WAPD-T-1648 Field 18E, 13A
CFSTI Prices: HC$5.00 MF$1.25

Pittsburgh Univ., Pa.
TRANSIENT ANALYSIS OF STEAM GENERATORS IN NUCLEAR POWER PLANTS USING DIGITAL COMPUTER TECHNIQUES.
Masters thesis,
by William Grant Clarke. 1965, 168p Unclassified report
Contract AT(11-1)-GEN-14
Descriptors: (*Gas generating systems, Nuclear power plants), (*Digital computers, analysis), Steampower plants.

WAPD-TM-421 Field 18J
CFSTI Prices: HC$2.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
AN INELASTIC CONTINUUM THEORY FOR DILATATING AGGREGATE MATERIALS,
by N. C. Small. Feb 65, 26p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Reactor fuel elements, Mixtures).

WAPD-TM-493 Field 18I, 9B
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
ROC-1: A FORTRAN PROGRAM FOR STORAGE OF EVALUATED NUCLEAR DATA,
by D. R. Harris, A. V. Vota, G. E. Morris, C. B. Noll, and H. Bohl, Jr. Jan 65, 51p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Reactor operations, Data storage systems), (*Programming(Computers), Reactor operations).

WAPD-TM-501 Field 18K, 18I, 9B
CFSTI Prices: HC$2.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
RAM-1, A FORTRAN PROGRAM TO TRANSFORM AND AVERAGE CROSS SECTIONS FROM THE ROD LIBRARY TAPE FOR USE IN MULTIGROUP NEUTRON TRANSPORT PROGRAMS,
by D. R. Harris, C. B. Noll, and A. V. Vota.
Apr 65, 30p
Contract AT(11-1)-GEN-14
Unclassified report

Descriptors: (*Neutron transport theory, Programming languages), (*Programming languages(Neutron transport theory)).

WCAP-6067 Field 18J
CFSTI Prices: HC$5.00 MF$1.00

Westinghouse Electric Corp., Pittsburgh, Pa.
Atomic Power Div.
EVALUATION OF GAMMA ACTIVITY DISTRIBUTIONS IN YANKEE CORE I AND CORE II SPENT FUEL,
by R. J. Nodvik. Jun 65, 100p
Contract AT(30-1)-3017
Unclassified report

Descriptors: (*Reactor cores, Gamma emission), (*Fuel burn up, Reactor cores).

19. Ordnance

UCRL-14155 Field 19D, 9B
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
REDUCTION OF PHOTOGRAPHIC SURFACE-MOTION DATA BY DIGITAL COMPUTER,
by Robert W. Terhune, Roger L. Fulton and J. B. Knox. 12 May 65, 39p
Contract W-7405-eng-48
Unclassified report

Descriptors: (*Cratering, Photographic analysis), (*Photographic analysis, Data processing systems).

20. Physics

ACNP-64029 Field 20D
CFSTI Prices: HC$3.00 MF$0.75

Allis-Chalmers Mfg. Co. Milwaukee, Wis.
Atomic Energy Div.
INVESTIGATION OF VAPOR VOLUME FRACTION AND SLIP VELOCITY UNDER THE EURATOM PROGRAM.

Final rept.,
by Kenneth F. Neusen, Mark Healy, Winfred A. Bezella, and Glenn J. Kangas. Nov 64, 96p EURAEC-1291
Contract AT(11-1)-1272

Unclassified report

Descriptors: (*Steam, Fluid flow), (*Vapors, Volume).

AD-443 487 Field 20B
CFSTI Price: HC$2.00

Carborundum Co., Niagara Falls, N. Y. Research and Development Div.
INTERSTITIAL COMPOUNDS OF BORON AND TRANSITION METALS,
by V. I. Matkovich, R. F. Giese, Jr., and J. Economy. Jul 64, 31p Technical rept. no. TR-3
Contract Nonr407500, Proj. NR056 449

Unclassified report

Descriptors: (*Borides, Crystal structure), (*Crystal structure, Boron), (*Boron, Crystal structure), Beryllium compounds, Carbon compounds, Aluminum compounds, Symmetry(Crystallography), Crystal lattice defects, Atomic properties.

A study was made of the structural properties common to all borides and modifications of boron which contain B12 polyhedral units. It has been found that all unit cell dimensions in these structures can be derived from simple arrangements of B12 units which can be regarded as large metallic atoms that form interstitial compounds. The B12 units can also group together to form larger units such as the recently reported B84. These are also treated as individual entities. On this basis all the structures have been classified into three simple packing models: (1) cubic closest packing, (2) hexagonal closest packing, and (3) tetragonal closest packing. Occurrence of tetragonal closest packing with 10 closest neighbors is unusual and is discussed in detail. The proposed simple models and their subclassifications lead to a successful interpretation of observed data and should provide a basis for prediction of possible structures of the B12 borides. (Author)

ANL-6940 Field 20H, 12A
CFSTI Prices: HC$3.00 MF$0.50

Argonne National Lab., Ill.
A SPECTRAL THEORY FOR THE STATIONARY TRANSPORT OPERATOR IN SLAB GEOMETRY.
by Erwin H. Bareiss. Dec 64, 54p N65-19543
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Neutron transport theory, Operators-(Mathematics)), (*Operators(Mathematics), Neutron transport theory).

ANL-6948 Field 20M
CFSTI Prices: HC$5.00 MF$1.00

Argonne National Lab., Ill.
CONDENSATION OF METAL VAPORS MERCURY AND THE KINETIC THEORY OF CONDENSATION.
Doctoral thesis,
by Donald J. Wilhelm. Oct 64, 159p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Condensation, Vapors), (*Kinetic theory, Metals).

ANL-6963 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Argonne National Lab., Ill.
ELECTRICAL END LOSSES IN AN MHD CHANNEL OF LINEARLY VARIABLE CROSS SECTION,
by Jerzy R. Moszynski. Mar 65, 25p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Magnetohydrodynamics, Electrical properties), (*Electrical properties, Plasma medium).

ANL-7004 Field 20M, 7D
CFSTI Prices: HC$5.00 MF$1.00

Argonne National Lab., Ill.
PROPERTY VALUES OF PARAHYDROGEN,
by Mark E. Stephenson. Mar 65, 167p
Contract W-31-109-eng-38

Unclassified report

Descriptors: (*Hydrogen, Thermodynamics).

BNL-903 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
ORIENTED NUCLEI. BROOKHAVEN LECTURE SERIES NO. 40,
by Vance L. Sailor. 14 Oct 64, 16p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Nuclei, Nuclear properties).

BNL-7954 Field 20B
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
SIGNIFICANCE TESTS ON THE CRYSTALLOGRAPHIC R-FACTOR,
by Walter C. Hamilton. 1964, 28p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Crystal structure, Statistical tests).

BNL-8062 Field 20B, 8G, 7B
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
POSITION AND THERMAL PARAMETERS OF OXYGEN ATOMS IN CALCITE,
by Henry Chessin, Walter C. Hamilton, and Ben Post. 1963, 14p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Calcite, Crystal lattices), (*Oxygen, Calcite).

BNL-8467 Field 20H
CFSTI Prices: HC$1.10 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A STUDY OF THE RECOIL REACTIONS OF THREE ISOTOPES OF RUTHENIUM IN RUTHENOCENE.
by Garman Harbottle and Ursel Zahn. 1964, 21p
CONF-773-2
Contract AT(30-2)-GEN-16 Unclassified report

Presented at the Symposium on Chemical Effects Associated with Nuclear Reactions and Radioactive Transformation, Vienna, Dec 64.

Descriptors: (*Ruthenium, Isotopes), (*Nuclear reactions, Ruthenium).

BNL-8662 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
THE FAST KICKER OF THE AGS EXTERNAL BEAM SYSTEM.
Internal rept.,
by E. B. Forsyth. 27 Oct 64, 22p Unclassified report
Contract AT-30-2-GEN-16

Descriptors: (*Particle accelerators, Electromagnetic pulses), (*Electromagnetic pulses, Particle beams).

BNL-8676 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
COMPARISON OF 500-MEV INJECTORS FOR THE BROOKHAVEN AGS,
by E. D. Courant. 2 Dec 64, 7p AADD-55
Contract AT(30-2)-GEN-16 Unclassified report

Descriptors: (*Proton accelerators, Injectors).

BNL-8790 Field 20G
CFSTI Prices: HC$2.00 MF$0.75

Brookhaven National Lab., Upton, N. Y.
CAPACITOR CHARGING SYSTEMS,
by H. R. Shaylor and J. F. Sheehan.
21 Dec 64, 47p AADD-58 Unclassified report
Contract AT(30-2)-GEN-16

Descriptors: (*Linear accelerators, Capacitors), (*Capacitors, Linear accelerators).

BNL-8858 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
FISSION OF HEAVY ELEMENTS BY HIGH-ENERGY PROTONS,
by Gerhart Friedlander. 1964, 27p
CONF-650301-4, SM60/63
Contract AT(30-2)-GEN-16 Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission, Proton reactions), (*Proton reactions, Fission).

BNL-8888 Field 20C, 12A
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
TWO-DIMENSIONAL FIELDS AS FUNCTIONS OF A COMPLEX VARIABLE,
by R. A. Bath. 9 Feb 65, 6p
Contract AT(30-2)-GEN-16
Unclassified report

Descriptors: (*Field theory, Complex variables), (*Complex variables, Field theory).

BNL-8913 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
MULTIPLY PERIODIC RF STRUCTURES FOR PROTON ACCELERATION.
Internal rept.,
by S. Giordano. 8 Feb 65, 8p Unclassified report
Contract AT(30-2)-GEN-16

Descriptors: (*Proton accelerators, Radiofrequency).

BNL-8945 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
BEAM INSTABILITIES IN CIRCULAR ACCELERATORS,
by E. D. Courant. 1965, 8p
CONF-650306-1 Unclassified report
Contract AT-30-2-GEN-16

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Particle beams), (*Particle beams, Particle accelerators).

BNL-8973 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
MACHINE OPERATION AT THE BROOKHAVEN ALTERNATING GRADIENT SYNCHROTRON,
by R. R. Adams, W. F. Gafers, and J. Spiro.
10 Mar 65, 6p CONF-650306-8
Contract AT(30-2)-GEN-16 Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Synchrotrons, Particle beams), (*Particle beams, Alternating gradient focusing accelerators).

BNL-9192 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
A MOTOR-GENERATOR RECTIFIER CONFIGURATION DESIGNED FOR FLAT-TOP,
by R. L. Cassel. 1 Apr 65, 9p
Contract AT(30-2)-GEN-16 Unclassified report

Descriptors: (*Rectifiers, Configuration), (*Motor generators, Rectifiers).

CONF-543-20 Field 20B, 7B
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J.
DISLOCATION INTERACTIONS DURING THE PLASTIC DEFORMATION OF IONIC CRYSTALS AT LOW TEMPERATURES,
by B. S. H. Royce and R. Smoluchowski. 1964, 17p
Contract AT(30-1)-937
Unclassified report

Presented at the American Physical Society Meeting, Philadelphia, Pa. 23-26 Mar 64.

Descriptors: (*Alkali metal compounds, Halides), (*Crystal structure, Deformation), Crystal lattice defects, Low-temperature research, Surface properties.

CONF-651-83 Field 20B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y. Materials Science Center.
FAR-INFRARED IMPURITY MODES IN POTASSIUM IODIDE.
Rept. no. 253,
by A. J. Sievers. 1 Sep 64, 12p
Contract AT(30-1)-2179
Unclassified report

Presented at 9th International Conference on Low Temperature Physics, Columbus, Ohio, 31 Aug-4 Sep 64.

Descriptors: (*Crystal lattice defects, Infrared spectroscopy), (*Potassium compounds, Iodides).

CONF-640204 Field 20F
CFSTI Prices: HC$4.00 MF$1.00

Argonne National Lab., Ill.
PROCEEDINGS OF THE AMU - ANL HIGH VOLTAGE ELECTRON MICROSCOPE MEETING HELD AT ARGONNE NATIONAL LABORATORY, FEBRUARY 13-14, 1964.
Feb 64, 144p Unclassified report
Contract W-31-109-eng-38
Descriptors: (*Electron microscopes, Symposia).

CONF-650425-1 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Du Pont de Nemours (E. I.) And Co., Aiken, S. C. Savannah River Lab.
MOSSBAUER EFFECT STUDIES WITH ACTINIDES,
by J. A. Stone. 7 Apr 65, 34p Unclassified report
Contract AT(07-2)-1
Presented at the Panel on the uses of the Mossbauer effect in chemistry and solid state physics, Vienna, 26-30 Apr 65.

Descriptors: (*Mossbauer effect, Actinide series), (*Actinide series, Mossbauer effect).

COO-347-16 Field 20H
CFSTI Prices: HC$4.00 MF$0.75

Purdue Univ., Lafayette, Ind. Dept. of Chemistry.
THE FISSION OF LUTETIUM AT LOW EXCITATION ENERGY.
Doctoral thesis,
by Herman W. Andre. Jun 64, 112p
Contract AT(11-1)-347
Unclassified report

Descriptors: (*Fission, Lutecium), (*Lutecium, Excitation).

COO-535-543 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Colorado Univ., Boulder. Dept. of Physics and Astrophysics.
A CYCLOTRON POWER-AMPLIFIER RF SYSTEM USING A 4CW50,000C/8350 TETRODE,
by Jon W. Osterlund and Rodman Smythe. 1963, 12p UCOL-65-39
Contract AT(11-1)-535
Unclassified report

Descriptors: (*Cyclotrons, Power amplifiers), (*Tetrodes, Particle accelerators).

COO-623-105 Field 20L
CFSTI Prices: HC$1.00 MF$0.50

Case Inst. of Tech., Cleveland, Ohio.
SOLID STATE PHYSICS PROGRAM.
Annual progress rept. for Nov 63-Oct 64.
1 Nov 64, 20p Unclassified report
Contract AT(11-1)-623
Descriptors: (*Solid state physics, Reports).

COO-744-5 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Ohio State Univ. Research Foundation, Columbus.
FLUID-SOLID HEAT TRANSFER STUDY.
Final rept., 1 May 59-30 Sep 64,
by Robert S. Brodkey. Oct 64, 46p
Contract AT(11-1)-774, Proj. RF-929
Unclassified report

Descriptors: (*Heat transfer, Fluids), (*Solids, Heat transfer).

COO-1428-6 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Purdue Univ., Lafayette, Ind.
THE HIGH ENERGY PHOTODISINTEGRATION OF HE 4,
by J. G. Asbury and F. J. Loeffler. 1963, 27p
Contract AT(11-1)-1428
Unclassified report

Descriptors: (*Alpha particle reactions, Deuteron reactions), (*Deuterons, Alpha particle reactions), Helium.

COO-1428-7 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Purdue Univ., Lafayette, Ind.
PRODUCTION OF SIGMA PLUS KAPPA PLUS BY PI PLUS, P INTERACTIONS AT 1111 MEV/C, 1206 MEV/C, AND 1265 MEV/C,
by N. L. Carayannopoulos, G. W. Tautfest, and R. B. Willmann. 1963, 27p Unclassified report
Contract AT(11-1)-1428
Descriptors: (*Liquefied gases, Bubble chambers), (*Pions, Nuclear reactions).

DLCS-3430106 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Duquesne Light Co., Shippingport, Pa.
PERIODIC CALIBRATION OF REACTOR PLANT INSTRUMENTATION (PRESSURE, FLOW, LEVEL AND DIFFERENTIAL PRESSURE). CORE 1, SEED 4. TEST EVALUATION.
22 May 64, 8p Unclassified report
Contract AT(11-1)-292
Descriptors: (*Reactor system components, Calibration).

DLCS-5001164 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Duquesne Light Co., Shippingport, Pa.
MONTHLY OPERATING REPORT ON PWR OPERATIONS.
Nov 64, 36p
Contract AT(11-1)-292
Unclassified report

Descriptors: (*Power reactors, Reactor operation).

EURAEC-1248 Field 20M, 20D
CFSTI Prices: HC$1.00 MF$0.50

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Suresnes (France). Division Atomique.
PROGRESS IN WORK UNDER WAY FOR THE THIRD QUARTER 1964.
Quarterly rept. no. 18.
4 Nov 64, 4p
Contract 061-64-7-TEEF

Unclassified report

Descriptors: (*Heat transfer, Fluid flow), (*Fluid flow, Heat transfer).

EURAEC-1288 Field 20M, 20D
CFSTI Prices: HC$1.00 MF$0.50

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Suresnes (France).
PROGRESS OF WORK DURING THE FOURTH QUARTER 1964.
Quarterly rept. no. 19,
by C. Moussez. 11 Jan 65, 9p
Contract 061-64-7-TEEF

Unclassified report

Descriptors: (*Heat transfer, Fluid flow), (*Fluid flow, Heat transfer).

GEAP-4778 Field 20D, 20M
CFSTI Prices: HC$3.00 MF$0.75

General Electric Co., Schenectady, N. Y. Advanced Technology Labs.
A PROGRAM OF TWO-PHASE FLOW INVESTIGATION.
Quarterly rept. no. 7, Oct-Dec 64,
by G. Bijwaard, F. W. Staub, and N. Zuber. Jan 65, 96p EURAEC-1326
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Fluid flow, Phase studies), (*Phase studies, Fluid flow).

GEAP-4798 Field 20D, 20M
CFSTI Prices: HC$1.00 MF$0.50

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
TWO-PHASE FLOW AND HEAT TRANSFER IN MULTIROD GEOMETRIES.
Quarterly progress rept. no. 1, 26 Oct 64-25 Jan 65.
Feb 65, 22p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Fluid flow, Heat transfer), (*Heat transfer, Fluid flow).

GEAP-4846 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
TRANSPORT EQUIVALENT DIFFUSION THEORY.
Quarterly progress rept. no. 4, 1 Jan-31 Mar 65,
by G. H. Kear. 1 Apr 65, 14p EURAEC-1388
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Diffusion, Neutron transport theory), (*Neutron transport theory, Diffusion).

IDO-17017 Field 20F
CFSTI Prices: HC$5.00 MF$1.00

Phillips Petroleum Co., Idaho Falls, Idaho. Atomic Energy Div.
THE CALCULATION OF GAMMA-RAY SHAPES FOR SODIUM IODIDE SCINTILLATION SPECTROMETERS, COMPUTER PROGRAMS AND EXPERIMENTAL PROBLEMS,
by R. L. Heath, R. G. Helmer, L. A. Schmittroth, and G. A. Cazier. Apr 65, 166p
Contract AT(10-1)-205

Unclassified report

Descriptors: (*Spectrum analyzers, Optical properties), (*Gamma-ray spectra, Programming-(Computers)).

IS-989 Field 20H, 18D, 9B
CFSTI Prices: HC$2.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
WRITING TOPOLOGICAL PROGRAMS FOR I.S.U. GUTS,
by William J. Kerhan, William J. Higby, and Iva H. Boessenroth. Sep 64, 49p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Particle trajectories, Topology), (*Topology, Programming(Computers)).

IS-1032 Field 20H, 18D
CFSTI Prices: HC$4.00 MF$1.00

Ames Lab., Iowa State Univ. of Science and Tech.
MEASUREMENTS OF SOME INTERNAL CONVERSION COEFFICIENTS USING SCINTILLATION COUNTER, COINCIDENCE TECHNIQUES,
by Ronald S. Dingus, W. L. Talbert, Jr. and E. N. Hatch. Feb 65, 131p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Internal conversion, Coincidence counting), (*Coincidence counting, Internal conversion).

IS-1070 Field 20M, 11F
CFSTI Prices: HC$3.00 MF$0.75

Ames Lab., Iowa State Univ. of Science and Tech.
APPLICATION OF AN ADIABATIC CALORIMETER TO THE DETERMINATION OF THE HEATS OF FUSION AND HEATS OF FORMATION OF SEVERAL METALLIC COMPOUNDS,
by Gerald J. Gartner and Premo Chiotti.
Feb 65, 71p
Contract W-7405-eng-82

Unclassified report

Rept. based on Master's thesis by G. J. Gartner.

Descriptors: (*Calorimeters, Metallurgy), (*Thermodynamics, Calorimeters).

IS-1071 Field 20H
CFSTI Prices: HC$5.00 MF$1.00

Ames Lab., Iowa State Univ. of Science and Tech.
SOME LIFETIME MEASUREMENTS OF ISOMERIC STATES IN THE RARE EARTH REGION WITH MAGNETIC COINCIDENCE BETA-RAY SPECTROMETERS,
by Robert E. McAdams and Eastman N. Hatch.
Nov 64, 180p
Contract W-7405-eng-82

Unclassified report

Descriptors: (*Isomeric transitions, Rare earth elements), (*Coincidence counting, Isomeric transitions).

IS-1086 Field 20H
CFSTI Prices: HC$4.00 MF$1.00

Ames Lab., Iowa State Univ. of Science and Tech.
PHOTONEUTRON CROSS SECTIONS OF PR 141, O 16 and C 12,
by John N. Bradford. Feb 65, 114p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Neutron cross sections, Gamma-neutron reactions), (*Gamma-neutron reactions, Neutron cross sections).

IS-1140 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Ames Lab., Iowa State Univ. of Science and Tech.
A MASS FORMULA FOR THE BARYON MASS SPECTRUM,
by Charles L. Hammer, and Thomas A. Weber.
Apr 65, 20p
Contract W-7405-eng-82
Unclassified report

Descriptors: (*Baryons, Mass spectrum), (*Mass spectrum, Mesons).

LA-3144 Field 20D
CFSTI Prices: HC$5.00 MF$1.00

Los Alamos Scientific Lab., Univ. of California, N. Mex.
NUMERICAL FLUID DYNAMICS USING THE PARTICLE-AND-FORCE METHOD. PART I. THE METHOD AND ITS APPLICATIONS. PART II. SOME BASIC PROPERTIES OF PARTICLE DYNAMICS,
by Bart J. Daly, Francis H. Harlow, James E. Welch, Edward N. Wilson, and Everett E. Sanmann. Sep 64, 164p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Fluid dynamic properties, Numerical methods and procedures).

LA-3189-MS Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE POWER CROWBAR ENERGY SYSTEM FOR SCYLLA IV,
by E. L. Kemp and W. E. Quinn. 10 Jun 64, 21p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plasma physics, Vacuum switches), (*Magnetic fields, Plasma physics).

LA-3201 Field 20F
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN ANALYSIS OF THE ABERRATIONS OF AN ASYMMETRICAL CZERNY-TURNER SPECTROGRAPH,
by Prince E. Rouse, Jr. Nov 64, 52p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Spectrum analyzers, Optical properties).

LA-3205-MS Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
BIBLIOGRAPHY OF NUCLEAR INTERACTIONS OF HE3 WITH D, N, OR P AND OF D WITH N, P, OR T AT 3-30 MEV,
by Betty S. Jackson. 9 Oct 64, 14p N65-20837
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Nuclear reactions, Bibliographies), (*Nuclear particles, Nuclear reactions).

LA-3206-MS Field 20H, 12A
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
STATUS OF THE LASL MONTE CARLO INTRANUCLEAR CASCADE CALCULATION (1964),
by S. L. Whetstone. 10 Dec 64, 26p N65-19663
Contract W-7405-eng-36
Unclassified report

Presented at the Gordon Res. Conf. on Nucl. Chemistry, 23 Jun 64.

Descriptors: (*Nuclear reactions, Monte Carlo method), (*Monte Carlo method, Nuclear reactions).

LA-3215 Field 20K
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE OVERDRIVING EFFECT IN DYNAMIC POLYMORPHISM,
by T. R. Loree, F. S. Minshall, and D. Stirpe.
Nov 64, 20p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Shock(Mechanics), Transformations), (*Metals, Shock(Mechanics)).

LA-3233 Field 20B, 9B
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN INTEGRATED SERIES OF CRYSTALLOGRAPHIC COMPUTER PROGRAMS. III. COMPARISON OF EQUIVALENT REFLECTION,
by R. B. Roof, Jr., D. T. Cromer, and A. C. Larson.
Nov 64, 33p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Programming(Computers), Crystal structure), (*Crystal structure, Single crystals).

LA-3246-MS Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THEORY OF HEAT PIPES,
by T. P. Cotter. 23 Feb 65, 34p N65-20720
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Pipes, Thermal conductivity).

LA-3250-MS Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE COMPRESSIBILITY OF GASEOUS MIXTURES OF HELIUM - NITROGEN AND HELIUM - DEUTERIUM AT HIGH PRESSURES,
by James D. Cramer. 15 Feb 65, 21p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Helium, Compressive properties), (*Nitrogen, Compressive properties), (*Deuterium, Compressive properties).

LA-3260-MS Field 20I, 18A
CFSTI Prices: HC$1.00

Los Alamos Scientific Lab., Univ. of California, N. Mex.
FINITE LARMOR ORBIT STABILIZATION,
by B. R. Suydam. 10 Mar 65, 15p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Thermonuclear reactions, Plasma physics), (*Plasma physics, Thermonuclear reactions).

LA-3264-MS Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RATH: THERMAL ANALYSIS PROGRAMS,
by R. F. Thomas, Jr. and M. D. J. Macroberts.
Mar 65, 43p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Thermodynamics, Programming-(Computers)).

LA-3266 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE INTERPRETATION OF NUCLEAR EXCITATION FUNCTIONS AT HIGH ENERGY ERICSON FLUCTUATIONS,
by William R. Gibbs. 15 Mar 65, 58p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Excitation, Nuclei).

LA-3270 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
EVALUATED NEUTRON CROSS SECTIONS FOR TRITIUM,
by Leona Stewart. Feb 65, 57p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Tritium, Neutron cross sections), (*Neutron cross sections, Tritium).

LA-3281 Field 20H
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
BIBLIOGRAPHY OF POLARIZATION AND ELASTIC SCATTERING OF PROTONS AND NEUTRONS FROM NUCLIDES,
by R. V. Winsor. 31 Dec 64, 55p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Elastic scattering, Nucleons), (*Nucleons, Polarization).

LA-3289-MS Field 20I, 18A
CFSTI Prices: HC$4.00 MF$1.00

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SCYLLA THETA-PINCH EXPERIMENTS: STATUS, PLANS, AND PROPOSAL FOR A CLOSED TOROIDAL THETA PINCH (SCYLLAC),
by W. E. Quinn, E. L. Ribe, W. B. Riesenfeld, G. A. Sawyer, and J. L. Tuck. 5 Apr 65, 108p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Plasma physics, Magnetic pinch), (*Magnetic pinch, Plasma physics).

LA-3294-MS Field 20I, 18A, 18K
CFSTI Prices: HC$3.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
FEASIBILITY STUDY OF A PULSED THERMONUCLEAR REACTOR,
by F. L. Ribe, T. A. Oliphant, and W. E. Quinn.
23 Apr 65, 55p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Thermonuclear reactions, Reactor feasibility studies), (*Reactor feasibility studies, Thermonuclear reactions).

LA-3305 Field 20L, 7B, 7D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE X-RAY FLUORESCENCE SPECTROMETRIC DETERMINATION OF CADMIUM IN SILVER-CADMIUM-COPPER ALLOYS,
by E. A. Nakkila, R. G. Hurley, and G. R. Waterbury.
19 Apr 65, 17p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Cadmium, X-ray spectrum).

LA-DC-6232 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE (HE3, D) REACTION ON THE N EQUAL 28 NUCLEI.
Doctoral thesis,
by Dale D. Armstrong. 1965, 94p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Deuteron reactions, Neutrons).

LA-DC-6352 Field 20I, 20H
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CONVERGENT PLASMA TEST PARTICLE PROBLEM,
by C. W. Hirt. 1962, 27p
Contract W-7405-eng-36
Unclassified report

Descriptors: (*Charged particles, Plasma physics), (*Plasma physics, Charged particles).

LA-DC-6353 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CONVERGENT ELECTRON PLASMA KINETIC EQUATION,
by C. W. Hirt. 1962, 19p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Plasma physics, Reaction kinetics), (*Quantum statistics, Plasma physics).

LA-DC-6382 Field 20B, 13A
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
HIGH-TEMPERATURE NEUTRON DIFFRACTION FURNACE,
by M. G. Bowman, W. G. Witteman, and G. P. Arnold. 1965, 14p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Neutron diffraction analysis, Refractory materials), (*Transformers, Heaters).

LA-DC-6383 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
EXPERIMENTAL STUDIES OF THE PENETRATION OF A PLASMA STEAM INTO A TRANSVERSE MAGNETIC FIELD,
by D. A. Baker and J. E. Hammel. 1964, 38p
Contract W-7405-eng-36

Unclassified report

Descriptors: (*Plasma physics, Magnetic fields), (*Magnetic fields, Plasma physics).

LA-DC-6639 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
SYMMETRY OF NEUTRON-INDUCED PU 239 FISSION IN RESONANCE REGION,
by G. A. Cowan, B. P. Bayhurst, R. J. Prestwood, J. S. Gilmore, and G. W. Knobelock. 1963, 13p
CONF-650301-7
Contract W-7405-eng-36

Unclassified report

Presented at the Symposium on the Physics and Chemistry of Fission, Salzburg, Austria.

Descriptors: (*Fission, Plutonium), (*Nuclear resonance, Plutonium).

LA-DC-6759 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
HIGH-POWER TEST ON A CLOVERLEAF CAVITY,
by J. R. Parker, J. D. Doss, R. W. Freyman, E. A. Knapp, and W. J. Shlaer. 1964, 8p CONF-650306-36
Contract W-7405-eng-36

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Power amplifiers), (*Power amplifiers, Particle accelerators).

LA-DC-6760 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RESONANTLY COUPLED ACCELERATING STRUCTURES FOR HIGH-CURRENT PROTON LINACS,
by B. C. Knapp, E. A. Knapp, G. J. Lucas, and J. M. Potter. 1964, 19p CONF-650306-33
Contract W-7405-eng-36

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Models(Simulations)), (*Protons, Particle accelerators).

LA-DC-6765 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
AN 805-MC 1-1/4-MW AMPLIFIER FOR ACCELERATOR SERVICE,
by D. C. Hagerman, J. D. Doss, R. W. Freyman, and J. R. Parker. 1965, 5p CONF-650306-29
Contract W-7405-eng-36

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Particle accelerators, Power amplifiers), (*Power amplifiers, Particle accelerators).

LA-DC-6775 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Massachusetts Univ., Amherst.
TRANSVERSE BEAM BLOW-UP IN A STANDING-WAVE LINAC CAVITY,
by R. L. Gluckstern and H. S. Butler. 1964, 14p
CONF-650306-32
Contract W-7405-eng-36

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Proton beams), (*Proton beams, Linear accelerators).

LA-DC-6777 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
BEAM DYNAMICAL CALCULATIONS WITH REALISTIC FIELDS IN A DRIFT TUBE LINEAR ACCELERATOR,
by Marvin Rich. 1964, 9p
CONF-650306-31
Contract W-7405-eng-36

Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Particle beams), (*Particle beams, Numerical analysis).

LA-DC-6780 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.

ELECTRON ANALOG TESTS OF PROTON LINEAR ACCELERATOR STRUCTURE,
by John E. Brolley, Jr., C. Robert Emigh, and Donald W. Mueller. 1965, 9p
CONF-650306-38
Contract W-7405-ENG-36
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Protons), (*Protons, Linear accelerators).

LA-DC-6856 Field 20F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
OPTIMIZING ZOOM SYSTEMS WITH THE LASL LENS DESIGN PROGRAM,
by Charles A. Lehmen. 1965, 17p CONF-650424-1
Contract W-7405-eng-36
Unclassified report

Presented at the Optimization Techniques Symposium, Pittsburgh.

Descriptors: (*Lens, Manufacturing methods), (*Telescope lenses, Optimization).

LA-DC-6875 Field 20G
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
DESIGN OF THE RF PHASE AND AMPLITUDE CONTROL SYSTEM FOR A PROTON LINEAR ACCELERATOR,
by Robert A. Jameson, Thomas F. Turner, and Ned A. Lindsay. 1965, 15p CONF-650306-30
Contract W-7405-eng-36
Unclassified report

Presented at the Particle Accelerator Conference, Washington, D. C.

Descriptors: (*Linear accelerators, Protons), (*Protons, Linear accelerators).

LA-DC-6897 Field 20H, 18D
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
NEUTRON CROSS-SECTION MEASUREMENTS WITH NUCLEAR DEVICES,
by P. A. Seeger. 1965, 13p CONF-650104-1
Contract W-7405-eng-36
Unclassified report

Presented at the NASA Conference on Nucleosynthesis, New York, 25-26 Jan 65.

Descriptors: (*Neutron cross sections, Measurement), (*Neutron detectors, Neutron cross sections).

LA-DC-6945 Field 20M
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
THE GENERATION OF OSCILLATIONS HAVING ACOUSTIC PROPERTIES IN FORCED CONVECTIVE HEAT TRANSFER TO CRYOGENS,
by Rodney S. Thurston. 1965, 13p CONF-650611-1
Contract W-7405-eng-36 Unclassified report

Presented at the symposium on heat flow below 100 degree K and its technological applications, Grenoble, France.

Descriptors: (*Heat transfer, Oscillation), (*Oscillation, Acoustic properties).

LA-MS-3079 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
RECENT PROGRESS IN TRANSPORT THEORY,
by G. I. Bell, B. G. Carlson, and K. D. Lathrop.
30 Apr 64, 37p Unclassified report
Contract W-7405-eng-36
Condensed version in NSA, v18 32709 from a/conf.28/P-261.

Descriptors: (*Integral equations, Photons), (*Neutron transport theory, Integral equations).

MATT-221 Field 20M, 8N
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
ON THERMODYNAMIC EQUILIBRIUM IN A GRAVITATIONAL FIELD,
by N. L. Balazs and J. M. Dawson. Nov 63, 22p
Contract AT(30-1)-1238 Unclassified report

Descriptors: (*Thermodynamics, Gravity), (*Gravity, Relativity theory).

MATT-290 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
ELECTRON CYCLOTRON HARMONIC RADIATION FROM A PLASMA,
by A. F. Kuckes and J. M. Dawson. Jul 64, 7p
CONF-641108-13; N64-28423 Unclassified report
Contract AT(30-1)-1238
Presented at the American Society, New York.

Descriptors: (*Cyclotrons, Plasma physics), (*Plasma physics, Electrons).

MATT-305 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
BEHAVIOR OF NEUTRAL HYDROGEN AND HELIUM IN C STELLARATOR DISCHARGES,
by F. W. Hofmann, A. S. Bishop, and E. Hinnov.
Sep 64, 23p
Contract AT(30-1)-1238
Unclassified report

Descriptors: (*Hydrogen, Gas discharges), (*Gas discharges, Helium).

MATT-310 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
CESIUM PLASMAS IN A MAGNETIC FIELD WITH VARIABLE CURVATURE,
by Nicola D'Angelo. Nov 64, 8p
Contract AT(30-1)-1238
Unclassified report

Descriptors: (*Plasma physics, Magnetic fields), (*Magnetic fields, Cesium electron tubes).

MATT-312 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
REMARKS ON THE I-V CHARACTERISTIC OF A HIGHLY IONIZED SEMI-COLLISIONLESS CESIUM PLASMA,
by N. D'Angelo. Nov 64, 17p
Contract AT(30-1)-1238

Unclassified report

Descriptors: (*Plasma physics, Gas ionization), (*Gas ionization, Cesium electron tubes).

MATT-314 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
PLASMA LOSSES IN A Q-DEVICE,
by N. Dangelo and S. V. Goeler. Dec 64, 27p
Contract AT(30-1)-1238

Unclassified report

Descriptors: (*Plasma physics, Probes(Electromagnetic)), (*Probes(Electromagnetic), Plasma physics).

MATT-328 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Princeton Univ., N. J. Plasma Physics Lab.
ENHANCED PLASMA LOSSES IN A Q-DEVICE,
by S. Goeler and N. D'Angelo. Jan 65, 7p
Contract AT(30-1)-1238

Unclassified report

Descriptors: (*Plasma physics, Probes(Electromagnetic), (*Probes(Electromagnetic, Plasma physics).

MIT-905-30 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.
THE ENERGY BALANCE IN FISSION AND MONTE CARLO CALCULATIONS ON PROMPT-NEUTRON EMISSION.
by G. E. Gordon and N. K. Aras. 1964, 34p
CONF-650305-1
Contract AT(30-1)-905

Unclassified report

Presented at the Conference on Physics and Chemistry of Fission, Vienna.

Descriptors: (*Fission, Monte Carlo method), (*Prompt neutrons, Fission neutrons).

MIT-3357-1 Field 20M
CFSTI Prices: HC$5.00 MF$1.00

Massachusetts Inst. of Tech., Cambridge. Dept. of Mechanical Engineering.
THE EFFECT OF SURFACE CONDITIONS ON NUCLEATE POOL BOILING HEAT TRANSFER TO SODIUM.
Technical rept. no. 5219-33,
by Paul J. Marto and Warren M. Rohsenow. Jan 65, 173p
Contract AT(30-1)-3357

Unclassified report

Descriptors: (*Nucleate boiling, Heat transfer), (*Surface properties, Sodium).

N65-12309 Field 20M, 11F
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
APPARATUS FOR MEASURING TEMPERATURE DROP ACROSS AN INTERFACE,
by C. F. Smith. 17 Jul 64, 19p NASA-TM-X-53091

Unclassified report

Descriptors: (*Temperature; Measurement), Aluminum alloys, Magnesium alloys, Vacuum.

N65-25599 Field 20E
CFSTI Prices: HC$2.50 MF$1.50

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
LASERS AND MASERS: A CONTINUING BIBLIOGRAPHY.
May 65, 283p NASA-SP-7009

Unclassified report

Descriptors: (*Lasers, Bibliographies).

N65-27346 Field 20H, 9B, 4A
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
A COMPUTER PROGRAM TO CALCULATE ARTIFICIAL RADIATION BELT DECAY FACTORS,
by E. G. Stassinopoulos. Jul 65, 11p
NASA-TN-D-2874

Unclassified report

Descriptors: (*Electrons, Life expectancy), (*Programming(Computers), Van Allen radiation belt), Upper atmosphere.

N65-28917 Field 20N, 17B, 22C
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
PLASMA EFFECTS ON APOLLO RE-ENTRY COMMUNICATION,
by Richard Lehnert and Bernard Rosenbaum.
Mar 65, 15p NASA-TN-D-2732

Unclassified report

Descriptors: (*Communication systems, Reentry vehicles), (*Plasma sheath, Radio transmission), Atmosphere entry, Blackout(Electromagnetic).

NAA-SR-MEMO-10067 Field 20K
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
RESPONSE OF A TWO DEGREE OF FREEDOM SYSTEM TO A GROUND APPLIED SHOCK,
by C. C. Rampton. 10 Jun 64, 23p
Contract AT(11-1)-GEN-8

Unclassified report

Descriptors: (*Shock(Mechanics), Loading(Mechanics)), (Loading(Mechanics), Shock(Mechanics)).

NAA-SR-MEMO-10315 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.

MERCURY WETTING AND ITS EFFECTS ON HEAT TRANSFER,
by J. M. Hochman. 21 Aug 64, 28p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Mercury, Surface-active substances), (*Heat transfer, Mercury).

NAA-SR-MEMO-10499 Field 20N
CFSTI Prices: HC$1.00 MF$0.50

Atomics International, Canoga Park, Calif.
ELECTROMAGNETIC INTERFERENCE TEST OF THE ANALOG POSITION SENSOR DEMODULATOR TYPE NE10FSM1-24-010, TYPE M 17414, SERIAL NUMBER 25,
by W. Holsborg. 29 Sep 64, 17p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Demodulators, Interference), (*Electromagnetic waves, Interference).

NAA-SR-MEMO-10591 Field 20K
CFSTI Prices: HC$2.00 MF$0.50

Atomics International, Canoga Park, Calif.
RESPONSE OF A ONE DEGREE OF FREEDOM VIBRATION SYSTEM TO VARIOUS SHOCK IMPULSES,
by D. Chin. 21 Oct 64, 21p
Contract AT(11-1)-GEN-8
Unclassified report

Descriptors: (*Structures, Shock(Mechanics)), (*Shock(Mechanics), Acceleration).

NLCO-929 Field 20F
CFSTI Prices: HC$2.00 MF$0.50

National Lead Co. of Ohio, Cincinnati.
THE APPLICABILITY OF THEORETICALLY CALCULATED INTENSITY CORRECTIONS IN MICROPROBE ANALYSIS,
by J. W. Colby. 24 Sep 64, 34p CONF-641018-3
Contract AT(30-1)-1156
Unclassified report

Presented at the Electron Microprobe Symposium, Washington, D. C. 12-15 Oct 64.

Descriptors: (*Electron diffraction analysis, Intensity).

NLCO-944 Field 20F
CFSTI Prices: HC$1.00 MF$0.50

National Lead Co. of Ohio, Cincinnati.
ABSORPTION CORRECTION TABLES FOR MICROPROBE ANALYSIS: EFFECT OF CRITICAL EXCITATION POTENTIAL,
by J. W. Colby. 7 May 65, 14p
Contract AT(30-1)-1156
Unclassified report

Descriptors: (*X-rays, Absorption).

NUMEC-3428-6 Field 20L, 18J, 20B
CFSTI Prices: HC$1.00 MF$0.50

Nuclear Materials and Equipment Corp., Apollo, Pa.
GROWTH OF SINGLE CRYSTALS OF PLUTONIUM.
Quarterly progress rept. 1 Oct-31 Dec 64.
1964, 14p
Contract AT(30-1)-2389
Unclassified report

Descriptors: (*Plutonium, Single crystals), (*Crystal growth, Plutonium), Plutonium alloys, Reactor fuels.

NYO-1154-1 Field 20M, 18J
CFSTI Prices: HC$4.00 MF$0.75

Connecticut Univ., Storrs.
DISTRIBUTION STUDIES BETWEEN MELTS AND SOLID PHASES USING RADIOACTIVE TRACERS.
Final rept.,
by W. C. Orr and Peter Vilinskas. 30 Jan 65, 105p
Contract AT(30-1)-1154
Unclassified report

Descriptors: (*Liquid metal coolants, Phase studies), (*Phase studies, Tracer studies).

NYO-2150-3 Field 20N, 20L
CFSTI Prices: HC$3.00 MF$0.75

Cornell Univ., Ithaca, N. Y. Materials Science Center.
MACROSCOPIC THEORY OF HELICONS.
Doctoral thesis,
by Charles Rudolf Legendy. Jun 64, 74p
Contract AT(30-1)-2150 Unclassified report

Descriptors: (*Electromagnetic waves, Solid State physics), (*Semiconductors, Electromagnetic waves).

NYO-2391-1 Field 20L
CFSTI Prices: HC$4.00 MF$1.00

Cornell Univ., Ithaca, N. Y. Materials Science Center.
TUNNELING BETWEEN SUPERCONDUCTORS: THE JOSEPHSON EFFECT.
Doctoral thesis,
by Alexis Baratoss. Sep 64, 145p Rept. no. 256
Contract AT(30-1)-2391 Unclassified report

Descriptors: (*Tunneling(Electronics), Superconductors), (*Superconductors, Tunneling(Electronics)).

NYO-2394-14 Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Brown Univ., Providence, R. I. Div. of Engineering.
DISLOCATION-PHONON INTERACTION.
Technical rept. no. 14,
by Tai Te Wu. Feb 65, 15p Unclassified report
Contract AT(30-1)-2394

Descriptors: (*Crystal lattice defects, Phonons), (*Phonons, Crystal lattice defects).

NYO-2471-7A Field 20B
CFSTI Prices: HC$1.00 MF$0.50

Cornell Univ., Ithaca, N. Y. Materials Science Center.
LOW TEMPERATURE DIELECTRIC PHENOMENA IN DOPED IONIC CRYSTALS,
by H. S. Sack and M. C. Moriarty. 27 Jan 65, 10p
Rept. no. 312
Contract AT(30-1)-2471 Unclassified report

Descriptors: (*Crystals, Dielectric properties), (*Dielectric properties, Crystals), Impurities, Low-temperature research.

NYO-2765-1 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Clarkson Coll. of Tech., Potsdam, N. Y. Div. of Research.
A FUNDAMENTAL STUDY OF HEAT AND MASS TRANSFER IN THE CONDENSATION OF MULTICOMPONENT SYSTEMS.
Progress rept.,
by Joseph Estrin and T. W. Hayes. 24 Feb 65, 49p
Contract AT(30-1)-2765

Unclassified report

Descriptors: (*Condensation, Transport properties), (*Heat transfer, Condensation).

NYO-3114-4 Field 20M
CFSTI Prices: HC$3.00 MF$0.75

Thayer School of Engineering, Dartmouth Coll., Hanover, N. H.
TWO-PHASE FLOW AND BOILING HEAT TRANSFER.
Quarterly progress rept. for Jul-Sep 64,
by G. B. Wallis, J. M. Turner, I. Bemberis and D. Kaufman. Oct 64, 58p EURAEC-1247
Contract AT(30-1)-3114-1

Unclassified report

Descriptors: (*Heat transfer, Fluid flow).

NYO-3399-07 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Syracuse Univ., N. Y. Dept. of Physics.
THE DYNAMICAL ORIGIN OF SYMMETRY OF ELEMENTARY PARTICLES,
by E. C. G. Sudarshan. 1964, 23p CONF-641115-1
Contract AT(30-1)-3399

Unclassified report

Presented at American Physical Society Symposium on Symmetry in Particle Physics, Chicago, Nov 64.

Descriptors: (*Elementary particles, Nuclear structure).

NYO-3399-17 Field 20H, 20J
CFSTI Prices: HC$1.00 MF$0.50

Syracuse Univ., N. Y. Dept. of Physics.
QUESTION OF COMBINING INTERNAL SYMMETRIES AND THE LORENTZ GROUP,
by E. C. G. Sudarshan. 1965, 14p CONF-650105-3
Contract AT(30-1)-3399

Unclassified report

Presented at Conference on Symmetry Principles at High Energy (2nd), Coral Gables, Fla., 20-22 Jan 65.

Descriptors: (*Elementary particles, Relativity theory), (*Invariance, Quantum mechanics).

NYO-10567 Field 20H
CFSTI Prices: HC$3.00 MF$0.75

Carnegie Inst. of Tech., Pittsburgh, Pa.
POLARIZATION EFFECTS IN PI MINUS + P YIELDS PI MINUS + P AND P + P YIELDS PI PLUS + P + N AT MODERATELY HIGH ENERGIES.
Doctoral thesis,
by Peter B. Shaw. Oct 63, 87p Unclassified report
Contract AT(30-1)-882

Descriptors: (*Pions, Proton reactions), (*Proton reactions, Polarization).

ORNL-3794 Field 20B, 9B
CFSTI Prices: HC$4.00 MF$1.00

Oak Ridge National Lab., Tenn.
OR TEP: A FORTRAN THERMAL-ELLIPSOID PLOT PROGRAM FOR CRYSTAL STRUCTURE ILLUSTRATIONS,
by Carroll K. Johnson. Jun 65, 128p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Crystal structure, Mechanical drawings), (*Programming(Computers), Mechanical drawings).

ORNL-3796 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE EFFECT OF ACCOMODATION OF THERMAL TRANSPIRATION LIMITATIONS OF THE DUSTY GAS MODEL IN THE DESCRIPTION OF SURFACE SCATTERING,
by E. A. Mason and A. P. Malinauskas. Apr 65, 22p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Scattering, Kinetic theory), (*Evaporation, Scattering).

ORNL-P-116 Field 20E
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
LASER OSCILLATION IN HE - NE AT 3.3902 MU,
by H. W. Morgan, P. A. Staats, P. M. Griffin, K. L. Vander Sluis, and G. K. Werner. 1963, 3p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Lasers, Electron transitions), (*Electron transitions, Helium group gases).

ORNL-P-1127 Field 20F
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
THE EVALUATION OF COMPUTER PROGRAMS FOR GAMMA-RAY SPECTROMETRY IN ACTIVATION ANALYSIS,
by J. F. Emery, F. F. Dyer, and T. Alexander. 1964, 17p CONF-650405-3
Contract W-7405-eng-26

Unclassified report

Presented at the International Conference on Modern Trends in Activation Analysis, College Station, Tex.

Descriptors: (*Gamma-ray spectroscopy, Programming-(Computers)), (*Radioactivation analysis, Programming-(Computers)).

ORNL-RMIC-4 Field 20L

Oak Ridge National Lab., Tenn. Research Materials Information Center.
LISTS OF AVAILABLE AND DESIRED MATERIALS (ULTRAPURE INORGANIC RESEARCH MATERIALS),
by T. F. Connolly. Aug 65, 25p
Contract W7405eng26

Unclassified report

Available free from Research Materials Information Center, Oak Ridge National Lab., P.O. Box X, Oak Ridge, Tenn., as ORNL-RMIC-4.

Descriptors: (*Solid state physics, Materials), (*Single crystals, Solid state physics), Inorganic compounds, Semiconductors, Impurities, Purification, Particle size.

The Bulletin consists of two lists: high-purity inorganic solid-state research materials known to be available (or at least to have been produced) and materials about which information has been requested from the RMIC and for which no source could be found. The list of available materials is more selective, in several ways, than the earlier list published. Individual materials are represented in less variety; only the highest purity and largest size is given for each material. It should be assumed that for many of the materials shown, lower purities and other forms are probably available.

ORNL-TM-1054 Field 20D, 18F
CFSTI Prices: HC$1.00 MF$0.50

Oak Ridge National Lab., Tenn.
DIRECT OBSERVATION OF PARTICLE REENTRAINMENT FROM SURFACES,
by Liliana Mesironi and B. R. Fish. 10 Feb 65, 13p CONF-555-18
Contract W-7405-eng-26

Unclassified report

Presented at the International Symposium on Surface Contamination, Gatlinburg, Tenn., Jun 64.

Descriptors: (*Particles, Fluid dynamic properties), (*Surfaces, Contamination).

OTR-126 Field 20L

National Bureau of Standards, Washington, D. C. Inst. for Applied Technology.
ORGANIC SEMICONDUCTORS, Unclassified report
by Robert Levesque. Jun 65, 16p

Prepared in cooperation with Syracuse Univ. Research Corp., N. Y.
Available free from CFSTI.

Descriptors: (*Semiconductors, Organic materials), Plastics, Electrical conductance, Polymers, Organic compounds, Aromatic compounds, Semiconducting films, Crystals, Powders, Reviews, Abstracting, Bibliographies.

Significant reports covering the period since 1961 were selected for this study, with reference to earlier works. Government generated R and D in the field of organic semiconductors has proceeded within certain technical constraints which make it a promising yet rapidly developing field. This survey discusses some of these factors in terms of materials understanding and synthesis. Attention is also given to those developments which have been concerned with the electrical parameter measurements and evaluation of organic semiconductor materials. (Author)

SAN-409-12 Field 20M, 18N
CFSTI Prices: HC$5.00 MF$1.00

Geoscience, Ltd., Solana Beach, Calif.
HIGH ACCELERATION FIELD HEAT TRANSFER FOR AUXILIARY SPACE NUCLEAR POWER SYSTEMS.
Annual technical rept. 1 Sep 63-31 Aug 64.
1964, 159p GLR-27
Contract AT(04-3)-409

Unclassified report

Descriptors: (*Heat transfer, Liquid metal cooled reactors), (*Nuclear power plants, Spacecraft).

SAN-409-17 Field 20M, 18N
CFSTI Prices: HC$2.00 MF$0.50

Geoscience, Ltd., Solana Beach, Calif.
HIGH ACCELERATION FIELD HEAT TRANSFER FOR AUXILIARY SPACE NUCLEAR POWER SYSTEMS.
Quarterly technical rept. 1 Sep-30 Nov 64,
by N. F. Poppendiek, N. D. Greene, C. M. Sabin, R. K. Livett, and F. R. MacDonald. 1964, 30p GLR-32
Contract AT(04-3)-409

Unclassified report

Descriptors: (*Heat transfer, Potassium), (*Nuclear power plants, Spacecraft).

SLAC-36 Field 20G
CFSTI Prices: HC$3.00 MF$0.75

Stanford Linear Accelerator Center, Stanford Univ., Calif.
HIGH-REPETITION-RATE PULSER FOR BEAM SWITCHING MAGNET.
Technical rept.,
by J. L. Cole and J. J. Muray. Feb 65, 53p
Contract AT(04-3)-400

Unclassified report

Descriptors: (*Particle accelerators, Electromagnetic pulses), (*Particle beams, Switching circuits).

TID-20558 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Washington Univ., Seattle.
A COMPARISON OF SOME APPROXIMATIONS FOR SELF-BOUND MANY-FERMION SYSTEMS,
by D. S. Koltun, R. Puff, and A. S. Reiner. 1964, 45p
Contract AT(45-1)-1388

Unclassified report

Descriptors: (*Fermions, Green's function), (*Green's function, Fermions).

TID-21499 Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Florida Univ., Gainesville. Dept. of Physics and Astronomy.
ION BEAM-PLASMA INTERACTION.
Final rept. 15 Jul 60 - 31 Aug 64.
1964, 13p
Contract AT(40-1)-2783

Unclassified report

Descriptors: (*Plasma physics, Ion beams), (*Ion beams, Plasma physics).

TID-21565 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
IONIZATION AND CHARGE TRANSFER CROSS SECTIONS.
Technical status rept. no. 17, 1 Dec 63-30 Nov 64,
by D. W. Martin, E. W. Thomas, L. J. Puckett, and G. O. Taylor. 1 Dec 64, 15p
Contract AT(40-1)-2591

Unclassified report

Descriptors: (*Charged particles, Gas discharges), (*Gas ionization, Charged particles).

TID-21627 Field 20H
CFSTI Prices: HC$7.00 MF$2.75

Lawrence Radiation Lab., Univ. of California, Livermore.
THRESHOLDS FOR NEUTRON-INDUCED REACTIONS,
by R. J. Howerton, Donald Braff, W. J. Cahill and Nanette Chazan. May 64, 342p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Neutron reactions, Nuclear binding energy).

WAPD-T-1655 Field 20I
CFSTI Prices: HC$2.00 MF$0.50

Bettis Atomic Power Lab., Pittsburgh, Pa.
TRANSIENT MAGNETOHYDRODYNAMIC DUCT FLOW,
by P. L. Pfennigwerth and C. Sonnemann. Feb 64, 48p
Contract AT(11-1)-GEN-14

Unclassified report

Descriptors: (*Magnetohydrodynamics, Fluid flow).

WAPD-TM-395 Field 20H, 9B
CFSTI Prices: HC$3.00 MF$0.75

Bettis Atomic Power Lab., Pittsburgh, Pa.
THE UTILIZATION OF THE NEUTRON DIFFUSION PROGRAM PDQ-5,
by L. A. Hageman and C. J. Pfeifer. Jan 65, 721p
Contract AT(11-1)-GEN-14

Unclassified report

Descriptors: (*Neutron transport theory, Programming-(Computers)), (*Programming(Computers), Neutron transport theory).

UCRL-7155 (Rev. 1) Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
ZERO-ENERGY PARAMETERS FOR ATTRACTIVE AND REPULSIVE GAUSSIAN, EXPONENTIAL, YUKAWA, AND HARD-CORE YUKAWA POTENTIALS,
by Richard D. Levee and Robert L. Pexton. 7 Nov 63, 19p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear forces, Potential theory).

UCRL-7186-T Field 20K
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
PLANE STRESS PROBLEMS IN THE MATHEMATICAL THEORY OF ELASTICITY.
Masters' thesis,
by Maurice Zaslawsky. Feb 65, 93p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Elasticity, Stresses), (*Stresses, Elasticity).

UCRL-7729 Field 20K, 11B
CFSTI Prices: HC$4.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
SOME THEORETICAL AND EXPERIMENTAL ASPECTS OF DESIGN WITH BRITTLE MATERIAL,
by Ernest Y. Robinson. 3 Aug 64, 105p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Brittleness, Designs), Mathematical analysis, Stresses, Materials.

UCRL-7765-T (rev 1) Field 20E
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
EFFECTIVE FLUORESCENT LIFETIMES IN RUBY LASER RODS,
by J. A. Fleck, Jr. 15 Apr 64, 23p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Lasers, Fluorescence).

UCRL-7931 Field 20M
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
EXPERIMENTAL TECHNIQUES USED IN UNDERGROUND EQUATION OF STATE MEASUREMENTS,
by W. H. Gust and B. L. Hord. 15 Jul 64, 29p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Equations of State, Measurement).

UCRL-7980-T Field 20K
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
THE PROPAGATION OF SHOCKS IN EXPONENTIALLY DECREASING ATMOSPHERES,
by R. Grover and J. W. Hardy. 1964, 34p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Shock waves, Propagation).

UCRL-11884 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Berkeley.
SPIN AND DECAY PARAMETERS OF THE XI MINUS HYPERON,
by Janice Button-Shafer and Deane W. Merrill.
11 Jan 65, 42p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Hyperons, Nuclear spins), (*Decay schemes, Hyperons).

UCRL-12057 (rev 1) Field 20I
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
MICROWAVE EXCITATION OF A LIVERMORE PUFFATRON PLASMA AT THE ELECTRON CYCLOTRON FREQUENCY,
by J. L. Shohet and J. F. Steinhaus. 13 Jan 65, 15p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Plasma physics, Cyclotrons), (*Cyclotrons, Plasma physics).

UCRL-12136 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
L- AND M-SHELL IONIZATION CROSS SECTION FOR ND, SM, GD, TB, DY, AND HE USING 0.5 to 1.7 MEV PROTONS,
by R. D. Worley, D. L. Potter, and J. N. Khan.
26 Oct 64, 11p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Ionization, Probability), (*Atomic oribitals, Proton reactions).

UCRL-12303 Field 20I, 18A
CFSTI Prices: HC$5.00 MF$1.00

Lawrence Radiation Lab., Univ. of California, Livermore.
CONTROLLED THERMONUCLEAR RESEARCH.
Semiannual rept. for Jul-Sep 64.
1964, 163p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Thermonuclear reactions, Plasma physics), (*Plasma physics, Thermonuclear reactions).

UCRL-12344 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
EFFECT OF AN INELASTIC CHANNEL ON THE POSITION AND WIDTH OF A RESONANCE,
by M. Dersarkissian and Pran Nath. 15 Jan 65, 10p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear resonance, Phase shifters), (*Taylor's series, Nuclear resonance).

UCRL-12473 Field 20H, 20M, 20D, 20E
CFSTI Prices: HC$3.00 MF$0.75

Lawrence Radiation Lab., Univ. of California, Livermore.
PHYSICS DEPARTMENT PROGRESS REPORT, OCTOBER 1964 - JANUARY 1965,
Ed. by A. Lorenz. 1965 91p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Nuclear physics, Thermodynamics), (*Fluid flow, Lasers).

UCRL-14202 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Lawrence Radiation Lab., Univ. of California, Livermore.
PION-PROTON INELASTIC DATA,
by R. L. Rosenberg and L. D. Roper. 21 May 65, 18p
Contract W-7405-eng-48

Unclassified report

Descriptors: (*Inelastic scattering, Pions), (*Proton scattering, Pions).

UR-875-8 Field 20H
CFSTI Prices: HC$1.00 MF$0.50

Rochester Univ., N. Y. Dept. of Physics and Astronomy.
THE C 13(ALPHA, N)0 16 REACTION BETWEEN 5.9 AND 8.4 MEV,
by V. K. Deshpande and H. W. Fulbright. 11 Feb 64, 12p
Contract AT(30-1)-875

Unclassified report

Descriptors: (*Alpha particle reactions, Carbon), (*Neutron reactions, Oxygen).

UR-875-24 Field 20H
CFSTI Prices: HC$2.00 MF$0.50

Rochester Univ., N. Y. Dept. of Physics and Astronomy.
A BOUNDARY CONDITION MODEL. I. ANTINUCLEON-NUCLEON SCATTERING,
by Martin S. Spergel. 6 Mar 64, 43p
Contract AT(30-1)-875

Unclassified report

Descriptors: (*Nucleons, Scattering), (*Anti-particles, Elastic scattering).

21. Propulsion and Fuels

AD-450 941 Field 21B, 11L
CFSTI Price: HC$1.00

Naval Civil Engineering Lab., Port Hueneme, Calif.
GLOW IGNITION OF WOODS CAUSED BY HIGH THERMAL RADIATION-PONDEROSA PINE,
by F. W. Brown, III. 20 Aug 64, 19p
Technical note no. NCEL-TN-N-624 Unclassified report
Proj. Y-F011-05-02-336

Descriptors: (*Wood, Ignition), Thermal radiation, Moisture.

The limits for glow ignition of ponderosa pine have been measured as function of thermal irradiance and time for thick (1/2-inch) wood samples containing from 3 to 100 percent moisture by weight. (Author)

APEX-509 Field 21F
CFSTI Prices: HC$4.00 MF$1.00

General Electric Co., Cincinnati, Ohio. Nuclear Materials and Propulsion Operation.
SUMMARY REPORT OF HTRE NO. 3 NUCLEAR EXCURSION.
1963, 148p
Contracts AT(11-1)-171; AF33(600)-38062

Unclassified report

Descriptors: (*Aircraft nuclear propulsion, Test methods).

BNL-8808 Field 21D
CFSTI Prices: HC$1.00 MF$0.50

Brookhaven National Lab., Upton, N. Y.
LIQUID FUEL SYNTHESIS USING NUCLEAR POWER IN A MOBILE ENERGY DEPOT SYSTEM,
by M. Beller and M. Steinberg. Jan 65, 13p
Contract AT(30-2)-GEN-16

Unclassified report

Descriptors: (*Fuels, Synthesis(Chemistry)), (*Nuclear industrial applications, Fuels).

GEAP-3514 Field 21F
CFSTI Prices: HC$4.00 MF$1.00

General Electric Co., San Jose, Calif. Atomic Power Equipment Dept.
N. S. SAVANNAH FUEL DESIGN AND DEVELOPMENT PROGRAM. CORE II CRITICAL ASSEMBLY ANALYSIS,
by H. A. Brammer. 15 Nov 61, 119p
Contract AT(04-3)-189

Unclassified report

Descriptors: (*Nuclear powered vessels, Critical assemblies), (*Critical assemblies, Nuclear powered vessels).

LA-3161 Field 21F
CFSTI Prices: HC$3.00 MF$0.75

Los Alamos Scientific Lab., Univ. of California, N. Mex.
CRYOGENIC TENSILE TESTING OF PROJECT ROVER MATERIALS,
by D. T. Eash. Jun 64, 64p
Contract W-7405-eng-36

Unclassified repor

Descriptors: (*Materials, Nuclear propulsion), (*Tensile properties, Cryogenics), Cryostats.

LA-DC-6576 Field 21F
CFSTI Prices: HC$1.00 MF$0.50

Los Alamos Scientific Lab., Univ. of California, N. Mex.
INTEGRAL REACTOR TESTS IN PROJECT ROVER,
by Keith Boyer. 9 Oct 64, 7p CONF-797-2
Contract W-7405-eng-36

Unclassified report

Presented at the American Society of Mechanical Engineers, Albuquerque, N. Mex., Oct 64.

Descriptors: (*Nuclear propulsion, Rocket propulsion), (*Power reactors, Test methods).

N65-19502 Field 21C, 20I
CFSTI Prices: HC$7.00 MF$2.00

General Electric Co., Cincinnati, Ohio. Space Power and Propulsion Section.
THE PLASMA SEPARATOR ION ENGINE.
Summary rept. for 1 Apr 63-30 Jun 64,
by B. A. Free, W. N. Neiman, and G. P. Kerr, Jr.
15 Mar 65, 373p
Contract NAS3 3561
NASA CR-54240

Unclassified report

Descriptors: (*Ion engines, Plasma medium), (*Plasma medium, Ion engines).

ORNL-3775 Field 21F, 20J
CFSTI Prices: HC$3.00 MF$0.75

Oak Ridge National Lab., Tenn.
MARITIME REACTOR PROGRAM.
Annual progress rept. for period ending 30 Nov 63.
Mar 65, 89p
Contract W-7405-eng-26

Unclassified report

Descriptors: (*Nuclear powered vessels, Reactor materials).

PB-168 285 Field 21H, 11F, 13H
CFSTI Prices: HC$2.00 MF$0.50

Budd Co., Philadelphia, Pa. Product Research Div.
DEVELOPMENT OF HIGH PERFORMANCE ROCKET MOTOR CASE.
Technical engineering progress rept. no. 1, 21 Jun-31 Jul 60,
by R. C. Dethloff. 31 Jul 60, 46p
Contract DA36 034ORD3296RD,
Proj. OMS5010 1180800 51 03
AD 242 496

Unclassified report

See also AD-415 932.

Descriptors: (*Rocket cases, Rocket motors(Solid propellant)), (*Manufacturing methods, Rocket cases), Stainless steel, Titanium alloys, Iron alloys, Nickel alloys, Joining, Welding, Heat treatment, Chromium alloys, Vanadium alloys, Aluminum alloys.

PWAC-123 Field 21F, 13K, 20K
CFSTI Prices: HC$1.00 MF$0.50

Pratt and Whitney Aircraft, East Hartford, Conn.
FLEXIBILITY AND STRESS ANALYSIS OF A NAK PIPING SYSTEM FOR A NUCLEAR-POWERED AIRPLANE,
by A. W. Starbird. 17 Nov 54, 14p
Contract AT(11-1)-229

Unclassified report

Descriptors: (*Aircraft nuclear propulsion, Pipes), (*Pipes, Stresses).

TID-3582 Field 21F, 13J
CFSTI Prices: HC$2.00 MF$0.50

Division of Technical Information Extension (AEC), Oak Ridge, Tenn.
NS SAVANNAH. A LITERATURE SEARCH,
Comp. by Sidney F. Lanier. Jul 65, 44p

Unclassified report

Descriptors: (*Nuclear powered vessels, Bibliographies).

22. Space Technology

N65-15588 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
ENVIRONMENTAL TEST PROGRAM OF THE BEACON EXPLORER SPACECRAFT,
by R. M. Tysdal. Oct 64, 40p
NASA-TM-X-55119, X-320-64-307

Unclassified report

Descriptors: (*Environmental tests, Spacecraft), (*Spacecraft, Environmental tests), Design.

N65-16348 Field 22D
CFSTI Prices: HC$7.00 MF$1.75

National Aeronautics and Space Administration, Cocoa Beach, Fla. John F. Kennedy Space Center.

HISTORICAL ORIGINS OF NASA'S LAUNCH OPERATIONS CENTER TO JULY 1, 1962.
KSC historical monograph,
by Francis E. Jarrett, Jr., and Robert A. Lindemann.
Oct 64, 324p NASA-TM-X-54991, KHM-1
Unclassified report

Descriptors: (*Launching sites, History), (*History, Launching sites), Astronautics.

N65-16349 Field 22D
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
SATURN ILLUSTRATED CHRONOLOGY, APRIL 1957 TO JUNE 1964,
by Evelyn Falkowski. 10 Aug 64, 116p
NASA-TM-X-54992, MHR-3
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Data).

N65-16350 Field 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SATELLITE SITUATION REPORT, VOL. 4, NO. 23.
15 Dec 64, 16p NASA-TM-X-54993; X-533-63-1
Unclassified report

Descriptors: (*Satellites(Artificial), Abundance*) , Catalogs.

N65-16923-N65-16925 Field 22A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Washington, D. C.
SPACE AND PLANETARY ENVIRONMENT.
Jul 63, 33p NASA-TM-X-50116 Unclassified report
Prepared for presentation at the Manned Planetary Mission Technology Conference at Lewis Research Center, Cleveland, Ohio, on 21-23 May 63.

Descriptors: (*Space environmental conditions, Space flight), (*Meteorites, Hazards), Astronautics.

N65-19700 Field 22D, 17I
CFSTI Prices: HC$3.00 MF$0.50

National Aeronautics and Space Administration, Cocoa Beach, Fla. John F. Kennedy Space Center.
SATURN EARLY LAUNCH PHASE TRACKING BY CW DOPPLER.
13 Apr 64, 52p NASA-TM-X-56203, SP-79
Unclassified report

Descriptors: (*Launch vehicles(Aerospace), Radar tracking), (*Continuous wave radar, Feasibility studies), Doppler radar.

N65-20108 Field 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SATELLITE SITUATION REPORT, VOL. 5, NO. 2.
31 Jan 65, 17p NASA-TM-X-56185; X-533-63-1
Unclassified report

Descriptors: (*Satellites(Artificial), Abundance), Catalogs.

N65-21320 Field 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SATELLITE SITUATION REPORT, VOL. 5, NO. 3.
15 Feb 65, 20p NASA-TM-X-56296, X-533-63-1
Unclassified report

Prepared in cooperation with the Smithsonian Astrophysical Observatory, Cambridge, Mass.

Descriptors: (*Satellites(Artificial), Abundance), Catalogs.

N65-21321 Field 22B
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
SATELLITE SITUATION REPORT, VOL. 5, NO. 5.
15 Mar 65, 43p NASA-TM-X-56275, X-533-63-1
Unclassified report

Prepared in cooperation with Smithsonian Astrophysical Observatory, Cambridge, Mass.

Descriptors: (*Satellites(Artificial), Abundance), Catalogs.

N65-21965 Field 22B
CFSTI Prices: HC$2.25 MF$2.00

National Aeronautics and Space Administration, Washington, D. C. Scientific and Technical Information Div.
SCIENTIFIC FINDINGS FROM EXPLORER VI.
1965, 381p NASA-SP-54
Unclassified report

Includes N65-21966 - N65-21998.

Descriptors: (*Scientific satellites, Scientific research).

N65-24114 Field 22D
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Research Center, Langley Station, Va.
USE OF DYNAMIC MODELS IN LAUNCH-VEHICLE DEVELOPMENT,
by H. L. Runyan, H. G. Morgan, and J. S. Mixson.
1964, 37p NASA-TM-X-51630
Unclassified report

Presented at 16th Meeting of AGARD Struct. and Mater. Panel, Liege, 28 May 1964.

Descriptors: (*Launch vehicles(Aerospace), Structure(Properties)), (*Models(Simulations), Launch vehicles(Aerospace)).

N65-26255 Field 22C, 22A
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
SOME CONSIDERATIONS ON THE USE OF ATMOSPHERIC BRAKING FOR A TRANSFER INTO A MARTIAN ORBIT,
by Jacob H. Lichtenstein. Jun 65, 49p
NASA-TN-D-2837
Unclassified report

Descriptors: (*Mars probes, Astronautics), (*Astronautics, Mars probes).

N65-26259 Field 22C
CFSTI Prices: HC$2.00 MF$0.50

National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center.
APPLICATION OF INTRINSIC DIFFERENTIATION TO ORBITAL PROBLEMS INVOLVING CURVILINEAR COORDINATE SYSTEMS,
by James C. Howard. Jun 65, 26p
NASA-TN-D-2861

Unclassified report

Descriptors: (*Orbital trajectories, Tensor analysis), (*Tensor analysis, Orbital trajectories).

N65-26644 Field 22A, 1A
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
A PARAMETRIC STUDY OF THE AERODYNAMIC CHARACTERISTICS OF NOSE-CYLINDER-FLARE BODIES AT A MACH NUMBER OF 6.0,
by George C. Ashby, Jr. and Aubray M. Cary, Jr.
Jun 65, 74p NASA-TN-D-2854

Unclassified report

Descriptors: (*Reentry vehicles, Aerodynamic characteristics).

N65-27345 Field 22B
CFSTI Prices: HC$3.00 MF$0.75

National Aeronautics and Space Administration, Langley Station, Va. Langley Research Center.
CONVECTIVE AND EQUILIBRIUM RADIATION HEAT-TRANSFER PREDICTIONS FOR PROJECT FIRE REENTRY VEHICLE,
by P. Calvin Stainback. Jul 65, 74p
NASA-TN-D-2867

Unclassified report

Descriptors: (*Reentry vehicles, Heat transfer), (*Heat transfer, Reentry vehicles).

N65-28640 Field 22A, 20F, 22B
CFSTI Prices: HC$1.00 MF$0.50

National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
LIMITS ON OBSERVATIONAL CAPABILITIES OF AEROSPACECRAFT,
by John C. Evvard. Jul 65, 16p
NASA-TN-D-2933

Unclassified report

Descriptors: (*Aerospace craft, Vision), (*Light transmission, Aerospace craft).

SC-TM-64-1708 Field 22C
CFSTI Prices: HC$1.00 MF$0.50

Sandia Corp., Albuquerque, N. Mex.
TIME OF FREE FLIGHT AND MINIMUM ENERGY FOR ELLIPTICAL TRAJECTORIES,
by G. V. Barton. Nov 64, 12p
Contract AT(29-1)-789

Unclassified report

Descriptors: (*Elliptical orbit trajectories, Energy), (*Free flight trajectories, Elliptical orbit trajectories).

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